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American Antiquity

JUL 23 1942

A Quarterly Review of American Archaeology

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AMERICAN ANTIQUITY IS INDEXED IN THE INTERNATIONAL INDEX

Published by the

Society for American Archaeology

Vol. VIII *July, 1942* No. 1

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AMERICAN ANTIQUITY is published at 450–454 Ahnaip Street, Menasha, Wisconsin, quarterly in the months of January, April, July and October by the Society for American Archaeology. Subscription only by membership in the Society for American Archaeology (annual dues $3.00); includes the quarterly issues of AMERICAN ANTIQUITY and other releases as issued.

Entered as second-class matter July 22, 1935, at the post office at Menasha, Wisconsin, under the Act of March 3, 1879.

Contributions and publications for review should be sent to the Editor, Douglas S. Byers.

Subscriptions and orders for back numbers should be addressed to the Treasurer, Frederick Johnson.

AMERICAN ANTIQUITY

VOL. VIII JULY, 1942 No. 1

LEWIS H. MORGAN'S JOURNAL OF A TRIP TO SOUTHWESTERN COLORADO AND NEW MEXICO, JUNE 21 TO AUGUST 7, 1878

LESLIE A. WHITE, Ed.

Lewis Henry Morgan (1818–1881), the "Father of American Anthropology," was one of the most distinguished scientists of the nineteenth century. After graduating from Union College in 1840 he studied law, practising this profession in Rochester until 1862 when he gave it up to devote himself to scientific labors. His first work in anthropology was with the Iroquois. His *The League of the Iroquois*, "the first scientific account of an Indian tribe ever given to the world,"[1] appeared in 1851. This was followed by years of exhaustive research in the field of kinship and social organization, culminating in his monumental *Systems of Consanguinity and Affinity of the Human Family* (1871). His greatest work, *Ancient Society*, appeared in 1877. Translated into virtually all the languages of Europe and into Chinese and Japanese, this work has exerted a profound and enduring influence upon social science throughout the world. Morgan's last work, *Houses and House Life of the American Aborigines*, was pubiished in 1881, shortly before his death.

Although Morgan never held a position at a university or scientific institution, he was none the less active and influential. He was active in the American Association for the Advancement of Science for a quarter of a century, reading papers at its meetings and serving as chairman of the Section on Anthropology. He collaborated with Joseph Henry of the Smithsonian Institution, F. W. Putnam of the Peabody Museum, J. W. Powell of the Bureau of American Ethnology, Charles Eliot Norton of the Archaeological Institute of America, and many other distinguished men and institutions both at home and abroad. He travelled extensively in Europe in 1870–71, where he met such men as Darwin, Huxley, Maine, McLennan and Lubbock.[2] Union College conferred the degree of Doctor of Laws upon Morgan in 1873. He was elected to the National Academy of Sciences in 1875. And in 1880, he presided at the meeting of the American Association for the Advancement of Science as its President.[3]

Although commonly thought of as a "social anthropologist,"[4] Morgan had a vital and enduring interest in archaeology, particularly of the Southwest and of Mexico and Middle America. Before undertaking the trip described in the present JOURNAL, Morgan published "The Seven Cities of Cibola" (1869), which dealt with Mexico as well as the Southwest. Upon his return from the Southwest in 1878, Morgan read two papers at the St. Louis meeting of the American Association for the Advancement of Science: "On the Ruins of a Stone Pueblo on the Animas River, New Mexico, with a Ground Plan" (published in the 12th Annual Report of the Peabody Museum), and "Observations on

[1] Powell, 1880, p. 115. [2] White, 1937.

[3] For further data on Morgan, see Stern, 1931; Lowie, 1936; Powell, 1880; White, 1940; and sketches, by various men who knew him personally, in The Rochester Historical Society, Publication Fund Series, Vol. 2, 1923.

[4] "Morgan was undoubtedly the greatest sociologist of the past century . . ." (Haddon, 1910, p. 133).

the San Juan River District as an important Ancient Seat of Village Indian Life" (incorporated in *Houses and House Life*).

In 1879, the newly organized Archaeological Institute of America asked Morgan to prepare for them a plan of archaeological exploration and research in the American field.[5] He complied with this request with "A Study of the Houses of the American Aborigines, with suggestions for the exploration of the ruins in New Mexico, Arizona, the valley of the San Juan, and in Yucatan and Central America," (published in the 1st Annual Report of the Institute, pp. 27–80). It was Morgan who selected the man to undertake this work for the Institute: A. F. Bandelier, Morgan's pupil and friend, who was destined to achieve distinction in the Southwest, Mexico, and Peru.[6]

It is interesting thus to know Morgan as a pioneer in Southwestern archaeology. Prior to his trip to Colorado and New Mexico, Pueblo ruins had been described by only a few men who might be termed anthropologists, notably by Holmes, Jackson, and possibly a few others. It was Morgan who first undertook to interpret these ruins and to place Pueblo culture in the larger perspective of New World history and ethnology. For this interpretation Morgan drew upon all of the then available resources of archaeology, ethnology, and documentary history. Whatever shortcomings and defects his theory, both as regards the Southwest in particular and the American Indian in general, might have had, due to the extreme paucity of facts in his day, we see in Morgan's hypothesis a penetrating insight as well as a thorough grasp of what was known at that time.

We present, herewith, the brief Journal which Morgan kept of his trip to the Southwest in 1878. In those days, the railroad extended only to Canyon City, Colorado; from there the party proceeded by wagon. The itinerary, worked out as best we could from Morgan's account, is shown in Fig. 1. It has not been possible to identify with precision all of the places mentioned in the Journal. Nor have we been able to identify all of the ruins. The great "stone pueblo" on the Animas, described at length on pp. 10–14 (and also in the 12th Annual Report of the Peabody Museum and in *Houses and House Life*), is the famous Aztec ruin, later excavated by Morris.[7] The cliff ruins on the Mancos River (pp. 16–18), were described by Wm. Fellowes Morgan in a paper read before the St. Louis meeting of the American Association for the Advancement of Science in 1878, and published in the Proceedings. Morgan appears to have entered the region which has since become the Mesa Verde National Park. This region was first explored and described by Jackson, in 1874.[8] A year later, Holmes made a trip through Mancos canyon and examined several ruins. But "neither Jackson nor Holmes saw the most magnificent ruins of the Mesa Verde,"[9] viz., Cliff Palace and Sprucetree House. These were not discovered until 1888,[10] ten years after Morgan's trip. Morgan, who, we may note, was familiar with "the Hayden [Holmes, Jackson] reports," (see p. 19), went down the Mancos River, entered, presumably, Mesa Verde, came within rods, so to speak, of the wonders hidden there, but, like Holmes and Jackson, never saw them.

We have not made an exhaustive attempt to identify other sites visited by Morgan.

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[5] Archaeological Institute of America, 1880, p. 14.

[6] White, 1940, Vol. 1, pp. 1–108.

[7] "On July 22, 1878, Lewis H. Morgan visited the site, made a fairly thorough examination of the Aztec Ruin, and subsequently published a good description, and a reasonably accurate ground plan of the great pueblo," (Morris, 1919, p. 9).

[8] Jackson, 1876; Nordenskiold, 1893, p. 11; Fewkes, 1909, p. 2.

[9] Holmes, 1878; Nordenskiold, 1893, p. 12; Fewkes, 1909, p. 2. We quote from Fewkes.

[10] Nordenskiold, 1893, pp. 12–13; Fewkes, 1909, pp. 2–3.

Ruins in this region are exceedingly numerous,[11] and Morgan's landmarks (e.g., John Gregor's house), are not always easy to identify. But identification of each site is not necessary here. The main thing is the archaeological picture of the Southwest in the early days, and this, Morgan's Journal vividly provides.

Morgan was not in robust health in 1878, and his handwriting was not easy to read. When we have been in doubt about a word, we have placed a question mark in parenthesis (?), immediately following the word in question. When we have failed completely to make out a word, we have omitted it, leaving a blank space and a question mark in its place. We reproduce here (Pl. I) only one of the numerous sketches made by Morgan in his Journal. The original Journal is now in the Rush Rhees Library, University of Rochester, Rochester, N. Y. I am greatly indebted to Mr. John R. Russell, Librarian, for permission to transcribe and publish this interesting and valuable document. To Miss Margaret Butterfield, of the Library staff, I am very grateful for generous assistance.

THE JOURNAL

Cañon City, Colorado, June 21, 1878.

I did not intend to keep a journal, but bought this book to use in case we got as far as Taos, New Mexico. One reason is that it has become so difficult for me to write a legible hand. But I will commence at least and show why I am here. My nephew, David P. Morgan, of New York, asked me to go to Colorado with his two oldest sons, W. Fellowes[12] [Morgan], now a junior in Columbia College, and David Percy [Morgan], now about sixteen, to which I consented. William S. Sloan and Donald B. Toucey[13] were added to the party. We reached here the 19th of June. Fellowes and myself spending last Sunday at Highland, Ill. with Mr. Bandelier[14] very pleasantly, while the rest of the party remained at the Lindell House, St. Louis. It is not necessary to speak of our long journey by way of Kansas City, Topeka and the Arkansas river, to Pueblo, Colorado. At Topeka we saw Julia ? and Seymour. We then came southward by the Atchison, Topeka and Santa Fe Railroad to the Arkansas river which we followed about 400 miles to Pueblo. The country on this river, although west of the so-called line of arable land, looked well (the 100th meridian of longitude). We saw immense crops of growing corn larger than the corn in Illinois and also fair fields of

[11] " . . . there are probably more archaeological sites to the square mile in this district than in any other equal area in the entire Southwest. . . ." Kidder, 1924, p. 64.

[12] Although Wm. Fellowes Morgan took a keen interest in the expedition and read a paper on a cliff house at the St. Louis meeting of the American Association for the Advancement of Science (1878; paper published in the Proceedings), he did not follow his eminent uncle's footsteps and enter the field of anthropology. Instead he became a distinguished citizen and warehouseman in New York City (see *Who's Who in America*).

[13] Sloan and Toucey were also students at Columbia.

[14] For allusions to this visit, see Bandelier's letter to Morgan of May 2, 1878 (White, 1940, Vol. 2, pp. 97–98).

wheat, well-to-do young villages and a very considerable agricultural population, far greater than I expected to see. The railroad has done it by opening the country. Some person told me that the line of arable prairie was moving westward about 20 miles a year under the influence of cultivation which has increased the rain fall. How far this is true I know not. It has been a wet season and this has been a blessing to this part of the country. The last 100 miles of the plains before reaching Pueblo was very poor land, almost sterile.

We left Pueblo on a freight train in the morning for this place [Canyon City] where we arrived at twelve o'clock. The ride was still up the Arkansas, now a mountain stream, which we followed 45 miles into the mountains. On the north was the great elevation of Pike's Peak with its attendant mountains like the Bernese Alps,[15] the summits covered with heavy clouds. The clouds slowly dissolved showing snow on several mountains, but Pike's Peak remained covered. This we have not yet seen.

Cañon City is extremely well situated on a narrow table land surrounded by an amphitheatre of mountains of immense extent. It is a pretty place and will grow into a city. We went up yesterday about five miles along this river to the Royal cañon of the Arkansas about five miles west of this place. The A-T and Santa Fe Railroad are now making an embankment for a railroad to run through this cañon and on to Leadville, which when completed will be a picturesque ride for those fond of wild mountain scenery. At the commencement of the great canyon the Arkansas is confined within walls of rock less than 30 feet wide. The current is rapid and the channel is supposed to be as deep as wide, and to pass as much water at its mouth as the Mississippi, which may be true. We went up on a trail cut out of rock by the railroad a great deal of the way or excavated from the debris of the steep embankment.

There is a fine soda spring here of which I have been drinking very freely and which I like very much. It tastes like Congress water very much and bubbles up much in the same manner.

This morning I found two Indians from New Mexico at the door of the hotel, and one of them spoke broken English. He said they were Mescaleros as near as I could make it out, but said they were not Apaches. He may have meant Mexicans. The words he gave me, I think were Spanish. [They are Spanish. Morgan has spelled them phonetically.] He said they had clans and named the following:
1. Wolf, Lo-bo 2. Rabbit, Go-nä-ho 3. Coyote, Co-yote 4. Bear, Ho-so 5. Skunk, So-re-o 6. Beaver, Nutria 7. Wildcat, Gä-to-mon-tis 8. Lion,

[15] Cf. White, 1937, pp. 270–271.

Leon 9. (Something like Coyote) 10. Deer, Ba-mon-do 11. Antelope, Ba-ren-do 12. Buffalo, Ci-vola. I could not make out their tribe. Nutria suggested ? . One of them said he was of the Buffalo then Civola and as near as he could understand me said he was from Taos. He may have meant he had been there.

Homan's Park, Rocky Mountains, July 4, 1878.

This is the 8th day since we left Canyon City. We spent the first night on Current Creek. The second day before noon we passed the divide which separates the waters of the Arkansas from those of the Platte. The scene as we entered the South Park was remarkably fine, even magnificent. The park is about 60 miles long from north to south and 40 miles wide from east to west, which last was our direction. Vast mountains surrounded the park on all sides covered with patches of snow on their summits and far down their declivities. On the west and northerly sides of the great circle of mountains by which we were surrounded were Mt. Lincoln, Bross's Peak, Gray's Peak and several other mountains however with[out] names. It was certainly grand mountain scenery. I cannot stop to describe what is meant by a park except to say it is a species of plain, mostly level like a prairie, with patches of trees here and there, grassy underneath. Although houses and habitations are few the appearance is homelike. Domestic cattle are seen in the park in large numbers belonging to different ranches. We stopped at an abandoned log house in the midst of the park at the foot of a range of hills within the park and spent the night. The next day [we] crossed the remainder of the park and entered the cañon leading over the range and encamped in it well up the pass. It was a toll road. We started early and ascended by a tiresome road to the summit above the timber line and above the snow standing in patches on the mountains. The descent was more abrupt, the wind chill and the ride fatiguing. At night we encamped 3 miles from Leadville where we went the next morning to breakfast at the hotel. It is a struggling mining village, the center of a mining population of about 5000 people, a wide-awake town just a year old. The next day we went to Twin Lakes where we encamped for the night. They are quite beautiful, and the sight refreshing. We caught lake trout enough for supper. After crossing the range to Leadville we were again in the water of the Arkansas, the north fork. We descended this fork nearly to its mouth and crossed by a barren (?) route to the south fork where we encamped near the hot springs, some 14 in number, which are so hot that they will boil an egg in 12 minutes. This morning we started for the Poncha pass which separates the waters of the Arkansas from those of the Rio Grande. It is a toll road and the pass from the

place where we started is a low one and an easy one. Yet it is 10,500 feet high. It was the pass through the Sangre [de] Christo range. An 8 mile ride brought us to the summit and we entered another of those beautiful places surrounded by mountains which is such a striking feature of this Rocky Mountain country. The air was cool but delightful, for it is hot in the sun at this high elevation. I pulled out of the ground at the dividing ridge a splendid bunch grass which I shall take home for my collection. This grass grows nearly a foot high where protected, but this is the highest I have seen. These mountains will support a considerable population and in time will be occupied. There are fine grazing districts scattered through them and water to irrigate gardens and fields. We saw a good deal of irrigation in the region we have traversed and a chance for a great deal more. Corn will not ripen, but peas, and in some places oats and wheat will. The roads traversing these valleys are usually good, but sometimes ? when shut in by a watercourse at the forks of the Arkansas. This is the 4th of July. We cannot celebrate it, but we hail it with personal pleasure and reverence.

Henry H. Waller, our driver and the owner of the stock we are using on this journey, is an American from Tennessee, but he lived six years with Dakota or Sioux (?). He married the daughter of a trader by a Brule-Dakota woman, and has a fine family of children strongly marked on the Indian side. He has learned the language sufficiently for colloquial purposes. He has followed the Indians in the camp life on the plains and I have gained from him some valuable information. [We omit the data which Morgan records here, in about 800 words, dealing with the social organization, customs pertaining to hunting, distribution of food, etc., of the Brule-Dakota.]

Saguache, July 7, 1878.

We are here waiting for three stolen horses and have been here since Friday noon.

Some time on the way I had some conversation with Mr. L. [S?] M. Humphry about the Utes. He knows their ways, having traded with them as a merchant and once lived with them for six weeks in their tents in Middle Park. [We omit the data on the Utes obtained by Morgan from Humphry—about 500 words.]

Los Pinos Agency, July 9, 1878.

The three lost horses were returned on Sunday about noon, and after a stay of two days and a half at Saguache we left Monday morning at 8, and reached this point today at noon. The route thus far has been

a fine one, on a toll road. The grass had been fine, and the series of mountain parks and valleys through which we have passed only wants human inhabitants and land capable of cultivation to make it a pleasant country. Ranches here and there are met with, and moderate herds of cattle are seen. Last night I stopped with the toll gate keeper from whom I learned that snow fell but 15 inches the last two years, either winter. We expect to get within ten miles of Lake City tomorrow.

Silverton, July 16, 1878.

Yesterday we crossed the great range between Lake City and Silverton. It was laborious for man and beast. We ascended above the snow and above timber line, and found great masses of snow in the road around which we succeeded in passing. In one of these turn outs it takes five men with ropes attached to the side of the wagon to keep it from turning over. We passed three wagons which started two days ahead of us.

One curious feature of this mountain country is the use of burros or asses as beasts of burden. A drove of 26 has just passed loaded with boxes of merchandise of all kinds, and some things, such as shovels, lashed on their backs. Two men on horseback drove them. Nearly all merchandise is packed in on these asses as beasts of burden. They make but one drive a day, and all the food they get is the grass by the way. They can be bought for from $5 to $30 a head, and in the fall are of no value. I do not understand what the breed is, except that it is Mexican. They are less than half the size of a mule, about that of a large calf. They are used roughly. We saw them loading up a train this morning on our way. The Jack was blinded that he might not see whom to kick, and two men loaded him. Their lives are held in light esteem, and their treatment seems cruel. The mail in the mountains is carried on these animals, usually two, with a man walking behind him driving. We see them every day. They move along quickly. These animals are Mexican jackasses, called burros. They are smaller than the Texas jackasses.

The harness of the jacks consists of a saddle tree of wood and a small blanket secured by a circingle [surcingle]. There is also a belt passed across the breast secured to the saddle to prevent goods or packages from falling off behind in ascending steep hills, and another behind passing below the tail to prevent its falling off before in descending steep places. The saddle is simply to tie to. All the ore taken out at the mines is packed on these asses and thus carried to the stamp mills which are only found at the principal mining towns as Lake City, where there are two, and at Silverton where there is one and others in the vicinity.

Two hundred pounds is an ordinary load for an ass, so that ten will carry a ton and twenty, which is an ordinary train, will carry two tons. A train of asses thus ladened reminded me of the llamas of Peru who were used as beasts of burden and ladened and driven in much the same manner in the Inca period. They move along the road precisely in the manner of a flock of sheep, followed usually by two drivers, who rush after any one that strays from the road, and whips them in. As before remarked, they make but one drive each day, starting early. I do not know the distance, but presume it is at least 25 miles.

We left Silverton at 3 P.M. and went down the Animas toward Animas City some 45 miles distant. At the distance of about a mile the valley closed in and became a rock canyon, which we followed about five miles, and then encamped for the reason that the road became impassable. It is a very picturesque valley, the road of broken rocks exceedingly rough, a toll road made at great expense, and when finished will be a good route. It needs to have the rock pounded into McAdam[16] size. In New York the road as it now stands would be considered impassable over its whole length. Our wagon is a Bain wagon made for the roughest mountain travel, with a strong and perfectly made break [*sic*] which will stop both hind wheels when full set. At the point where we stopped the river which is now in flood, and a rapid for the whole five miles we have followed it in the canyon, ran over the road, and at each end great rocks in the road. We found a gang of men were at work on the road and had blasted down these rocks. The river is not fordable from its volume and rapidity. It is a large stream at this point. Since we finished breakfast ten or twelvè men of the toll company have appeared and commenced work. We hope to get in before noon. The two walls of the canyon where we are are about 200 feet apart, and the river about 60 feet. Some of the way the road was easily made, but the greater part required blasting down the rock to make a roadway because the river cut the walls of the canyon. This canyon is undoubtedly precisely like that of the Colorado, although granite seems to be the rock here. It rises over my head nearly vertical 1500 or 2000 feet. In places it is perpendicular nearly with benches setting back the uplift two or three times. Two of our party stood a watch over the horses through the night, with gun in hand against possible horse thieves. At 4 A.M. I went out to see Toucey then on duty. The moon nearly full was shining in great splendor down into the canyon making it nearly as light as day, and besides morning was just beginning to break. The great walls of rock on either side rising up boldly to such a great height made the scene memorable.

Was just introduced to Mr. James L. Wightman, superintendent

[16] John L. McAdam, a Scottish engineer, who originated macadamization.

and principal proprietor of the toll road of the Animas who is here with twelve men at the break repairing it. The road is 32 miles long, from near Silverton to old Animas City. He is a Scotchman and about 60. It is a great enterprise and deserving of credit and commendation. Since writing the above we have passed through the canyon to Cascade Hill eighteen miles from Silverton and up the mountain to the valley between the Spruce canyon of the Animas, and the next parallel range. From the place of our stoppage 5 miles from Silverton where we were on the left bank of the Animas we continued up about two miles and then crossed to the other side on a long bridge, the stream being divided into two. We continued on the right bank to Cascade Hill which I find is 20 miles from Silverton. We then went out of the valley or canyon by ascending the mountain by a steep road of $\frac{3}{4}$ of a mile, doubling on the mountain and going back but still up and then turning up a gulch or gorge which entered at right angles. It is a fine mountain road ascending I should say about 1500 feet in the course of a mile and a quarter which brought us up the two ascents. We then travelled in a sort of valley along the shores of three or four small lakes on which we saw beaver dams and one fine beaver lodge, and encamped at the end of the last one which was but a pond. Here at our camp we found a number of beaver cuttings, such as aspen or cotton wood. Fellowes secured a number of cuttings.[17] This road turns out of the canyon because a passage or road through it was impossible. We descend[ed] to the river again in the course of ten miles where the road ends. It is a remarkable enterprise the building of such an expensive road in a country too of which it is far in advance. It must have cost 50 or 60 thousand dollars to build it. The present toll can afford no compensation. The country may grow up to it, but the business and travel we have seen upon it is small. We have met but one wagon thus far: the mail, a buckboard with two horses. It connects with important points in the great San Juan mining district, Silverton and Animas City. It deserves commendation, as it shows faith and pluck. It is an excellent toll road, we all agree the best we have been on. Mr. Wightman is a bright and intelligent man.

Animas City, July 20, 1878.

We reached here yesterday, a small place of 150 inhabitants. In the afternoon we went over the river to the left bank to see the traces of ancient Indian occupation. We ascended to the mesa about a mile

[17] Morgan was an authority on the beaver having published an exhaustive treatise on this subject, *The American Beaver and his Works* (Philadelphia, 1868). This work was highly praised by the distinguished biologist, Jeffries Wyman and by Charles Darwin (White, 1937, pp. 248, 251, 339).

below the town, and collected a large amount of broken pieces of pottery. There are no remains of houses, but traces of fire pits were found. Stones set up on edge in a circle about three feet in diameter and six or eight inches high. It was at the angle of the hill where the mesa makes a bend nearly at right angles as the Missouri at the old Mandan village.[18] I found a spear (?) of flint knife stone.

We start this morning in a new outfit for the ruins near the mouth of the Animas. Henry has gone east 20 miles with the team to await our return a week or more hence. This ruin is a stone pueblo of moiety (?) size on the west side and about twelve miles above the mouth of the Animas. There are other ruins below it of a vague (?) kind, and traces of ancient occupation up the valley at various points as far as this place. It is a day and a half to the principal ruin and about 60 miles to the cliff houses on the Mancos. The Rio Chaco empties into the San Juan a few miles above the mouth of the Animas, and as the inhabitants of the seven villages of Cibola abandoned them after their capture by Coronado, in 1541,[19] they may have removed to the Animas valley and built this pueblo and others in the vicinity. I am quite eager to see it, as I never yet have seen a pueblo of any kind. This is said to be about 100 feet long by 75 deep, which is a small structure, but there are other structures in connection with it which when measured and studied out may be quite interesting.

Animas River, Pueblo ruins, July 22, 1878.

We reached here on Sunday July 21 after a rather tedious ride of 56 miles from Animas City. The ruins are remarkable for their size and present condition. There are the remains of four large pueblos, quite as large in accommodation as those on the Rio Chaco and as I conjecture built by the tribes of Cibola after Coronado captured their villages and the Indians deserted them. There are possibly more than 4 pueblos in the valley. There are 4 within an extent of a mile from the pueblo where we are encamped. We have today run out the measurements of one near us.[20] It is very much a copy of Hungo Pavie[21] and nearly of the same dimensions. The main back wall measures 368 feet and the wing or side wall 270–279. The main building was very plainly 5 stories high, as

[18] Morgan made four long field trips into the west in 1859–1862 to secure data on kinship systems (see Morgan, 1871, pp. 283–290). One of these trips took him to the Mandan villages on the Missouri (Morgan, 1881, p. 125).

[19] In "The Seven Cities of Cibola" (1869), Morgan supported the thesis that the famed "seven cities" were the great pueblos of Chaco Canyon. These pueblos were not captured by Coronado but were abandoned before the coming of the Spaniards.

[20] This was the great Aztec ruin (Morris, 1919, p. 9).

[21] One of the great pueblos of Chaco Canyon (see Morgan, 1881, p. 160). The Aztec ruin is indeed very much like the pueblos of the Chaco (see Kidder, 1924, p. 56).

there are 6 rows of apartments, and the side buildings 4 stories as there are four rows of apartments fully [or "fairly"] made out. The basement story is completely filled up, but the cedar beams supporting the roof are plainly to be seen in the wall about 8 inches thick and also the transverse small timbers in the side wall. Above this are still standing the second story and the third in the second range of apartments from the outside. So that the first story is obliterated by the falling in of the roofs of the stories above which filled them up, but the walls and cross walls of the main building are still standing for the second and in places of the third story. The size of the rooms in the wings can be made out pretty well for the greater part of the second story. The walls still standing are of stone, small in size, rarely a foot long and rarely six inches thick. At the doorways they seem to have been worked because there is a manifest attempt at a square corner. It must have been done as far as practicable by fracture, and the rest by rubbing. More than half of this great structure was made of cobble stone and mud adobe mortar, and this is part which has fallen into a mass of undistinguishable ruins. We entered some of the lower rooms in the side building west side, and found this wing faced with stone, [Here follow two pages containing a pencilled drawing of the ground plan of the pueblo ruins] and but half the size of the rooms above. We measured some with the following results. One was 4 ft. 6 in. wide and 16 ft. long and 8 ft. high. Another 16 ft. long and [blank] ft. wide and 8 ft. 7 inches high. One was entered by a trap door opening and it was the only means of admission to the room. It was the first one named. The trap was neatly formed of wood. It measured 1 ft. 4 in. by 1 ft. 5 in. The ladders were gone. Openings in the external wall are found in the second row of rooms from the main building opening into the outer rooms of the second story, which outer rooms have now disappeared. They are 12 to 20 inches square. All the rooms of the building do not communicate, but a number do. I measured two or three of the doorways, 2′6″ wide by 3′2″ high. The lintel was made of fir or red cedar limbs, and six inches in diameter. A good deal of cedar is used about 6, 8 and 10 inches in diameter and the ? is about as in the Chaco houses.

We entered two or three rooms in the ground story in the right wing, the west wing. All of these rooms were faced with stone, but the rooms were not large, the largest 16′6″ by 9′ wide and 9′6″ ceiling. The doors are small, but in these doors we see plain evidence of an attempt to dress the stone, and make it show a right angle. Yet while the square was obtained fairly it must have been done with a stone hammer. I intend to take some of these stones home, large and small.[22]

[22] "I brought away two of these stones . . . as samples . . ." (Morgan, 1880*a*, p. 544). One of these stones is pictured in this report (p. 544).

Today we finished the measurements of the principal pueblo and looked over the second about 100 rods from it. It is also of stone, about half [of] it, and the remainder of cobble stone and mud mortar. It seems to have been built up 3 from front to rear and a single story in front. In that event there must have been 6 or 8 rooms deep for three stories with rooms of adobe in front. Some of the rooms are quite small about 4 ft. × 12 ft.

The cedar used in these buildings is yellow cedar, a kind not found near the houses. There is no timber in the valley of the Animas at this point. West of it is the red cedar which is short and stumpy. Occasionally we saw a yellow cedar. Nearer Cascade Mountain we saw large amounts of yellow cedar. They must have brought it as they did the sand stones from long distances. Cobble stones are found in all the gulches, but the bluffs are free of stones.

The valley where these pueblos stand is fully two miles wide from bluff to bluff with the river running about through the center, leaving a mile on each side. It is substantially a level plain and made a garden in the Indian period by irrigation. The Animas is still a rapid river and has so much water as not to be fordable at high water. It can be forded on horseback at this season, July 22, when it is slowly subsiding. We did not find the acequia, or canal, used in this valley. I found that there were traces of irrigation on the opposite side of the river. The ruins are on the west side, 12 miles from the mouth.

There are four large pueblos within a mile and remains of six or eight smaller structures as shown [on] sketch. [Morgan has a drawing here.]

Along the west and north end of the second house cedar poles projected from the ceiling of the second story about 4 feet from the outside wall which is still standing. They are about four inches in diameter, of yellow cedar, and look as though they might have been used for military purposes. The first row of rooms in the house on the two sides are narrow rooms but 4 feet wide length-wise with each side. There are three stories still standing and as there must have been at least 5 there was not enough debris on the ground to explain the falling of the outer wall. One man informed me at Animas City who lived near the ruin, that near ¼ of the stones had been taken away by settlers to use in building houses, lining wells, etc. This would explain the absence of materials on the ground on the two sides. Also the small openings through walls for light, which are now seen in the outside wall of pueblo houses, and leave the beams to which ? about four feet apart to their proper use as ceiling timbers over narrow rooms. But I cannot pretend to be certain about this. The rooms on the lowest story are small. We entered several of them on the second story which were also small. The corner room of

the second story is 7′3″×7′5″, height 6′11″. Part of adobe floor in place. West side next room 8′7″ wide×15′ lengthwise with west side. Next room running inward from west front 11′7″×6′4″. Next row running inward from end of east 16′7″×6′4″. This last row 8′2″ high. All on second story.

On north side near middle of stone part—second story.

1. Room running inward 7′5″×[M's blank].
2. Room running inward 6′6″×3′4″. Height 8′.
3. Room running inward 8′4″×4′ This next estufa.

Front outside at another point, next to last.

1. Room from north side 4′7″ wide×14′2″ lengthwise with N. side.
2. Room inward from east and parallel 6′5″×14′9″.
3. Room inward from east and parallel 7′3″×16′9″.

All these rooms are faced with stone laid in courses substantially. The stones are small, 6 or 8 inches square or about the size of brick. They are laid up with adobe or mud mortar which remains in place and furnished a soft bond for the stones, but they trusted more to the level face of the stone than the bond of the mortar, which had very little bond, It crumbles with a slight touch. The wall is a good one well laid up, and good work. The stone is a sand stone prepared by fracture and the use of stone mauls. Much of the stone now fallen is ? . The ruins are immensely interesting as well as enormously extensive. In each building there are three stories standing while each was at least 5. The amount of fallen material is also immense. There are a number of places where all traces of structure have disappeared where the mass of stone and adobe is 20 feet deep. There are some cobble stones mixed in with this material. The part standing is of clear stone in both buildings both walls are faced with it. We found a few rooms in the second building of cobble stone and adobe.

A number of small rooms 4 feet wide and 8 or ten long can be seen in both houses with no doorway entering either. There was a neatly formed trap door in the top, one of which has been described. These were probably for corn and other stores. The Indians tried to keep two or three years supply of food and would store it in the strongest houses.

There were open recesses in some of the rooms of the first house which looked very much as though they might have served as chimneys. But the lintels were round pieces of cedar, and no flue above. We found no evidence of chimneys in either building. I don't think chimneys were known to the aborigines at the time of their discovery in any part of North America. There are no chimneys in the structures in ruins in Central America. The New Mexico pueblos have chimneys at the present time. They are built in the corner of the room and entire in ? and evidently formed no part of the original house.

The rooms in the first house in the second story have two door ways in each room and invariably from the outside to the inside. There was no communication between the row of rooms running inward and those on either side of them. It tends to show that the rooms were occupied in series those above occupying those below them, and those holding the outside rooms holding those within to the open court. It serves to indicate a kinship or part of a gens [clan], a group larger than a family.

I have mentioned the neatness of the trap doors through the floors of which I saw two or three. One I measured was 1′4″×1′5″ and the other 16″ square. The doorways of which I measured a number, were usually 2′6″ wide by 3′2″ high. Some were a trifle wider. The partition walls were under 3′ usually. I measured some 2′4″, some 2′9″. I saw some cases of walls 3 ft. and 3′6″ but they were exceptions. There is no sign of the use of lime in the masonry or of sand. It is adobe or mud mortar. Many of the partition walls are of stone on each face the filling between the faces being of stone with an abundant use of mud mortar.

The ceilings are the same in principle but with some variety. Round yellow cedar posts or beams, from four inches to twelve in diameter, are used according to the size of the room. A room 16′ long × ten wide would have about four round beams of the largest size passed across the room the narrow way, and built into the masonry. Transverse poles of the same wood and about 4 inches in diameter are then laid upon them quite near each other. Transversely upon these when not close together are placed rough pieces of fragments or limbs of cedar, over this is placed a flooring of mud mortar about 4 or 5 inches thick. In one room the ? crossing was small willow poles.

Beside other ruins within a mile of the main pueblo there is a stone pueblo in ruins on the San Juan about ten miles above the mouth of the Animas much like the two of stone near our camp.

The largest ruin near our camp is directly on the bank of the Animas. It is 1040 feet in circuit. The river is now cutting away its foundation. The amount of debris is enormous. It must be 15 and even 20 feet deep in places. It was, or seems to have been, of cobble stone and adobe mortar. At least there was no show of stone walls. An excavation might however reveal them. Its greatest length is along the river where the material is the highest, but it seems nearly as high at the center. The builders ought to have known better than plant a great house so near a rapid river in the midst of such a broad valley, as it is liable to shift its course every year [22] It is now undermining the foundations of the pueblo

[22] But it was not uncommon for the Pueblo Indians to build their villages on river banks only to have them swept away, in part at least, by torrents. Many pueblos on the Rio Grande have been partially destroyed by floods for decades. But they still build on the river banks to the present day.

and may in time carry the whole of it away. It is 300 feet over from the river to other side. About ¼ of a mile further up, and on the left bank of the Animas where all these structures are, there is another quite large pueblo in ruins, 452 feet in circuit. It was built of cobble stone and mud mortar. Some of the rooms in each of these are probably still entire, as the high mass of material over them mounts up. In other places great pit holes show chambers with ceilings fallen in.In one place where some excavator had done some work in the largest of the ? the corner of a room was in sight. These ruins ought to be excavated and fully worked out as [to] their plan both the adobe as well as the stone pueblos. Back of the second great stone pueblo are four separate ruins of considerable extent showing remains of clustered houses. One of them must have been 300 feet in circuit. The relations of these several structures are shown on the diagram. Besides these there is a large circular ruin between the two great buildings 333 feet in circuit and 111 ft. in diameter. It has the appearance of two concentric rows of houses around a central chamber the center of the roof of which was upheld probably by a joist as it was too broad to roof by their methods.

Mancos River, near House of John Gregor July 25, 1878.

We left the ruins on the Animas Tuesday at one o'clock for Animas City, but intending to turn west 12 miles this side, and go over to the Mancos to see a cliff house with 30 rooms, first visited by Mr. Gregor and by him and Gov. Axtell[24] last year. It is so far as we know new and unannounced in print. We travelled all Tuesday afternoon to the house of Mr. Pond where we encamped. We met him at Animas at dinner and he told us of a cliff house he had discovered, a small one, up an arroyo or valley running into the La Plata valley. In going to the ruins we went down the La Plata valley instead of the Animas and passed by his house. He said he would be back and go with us. As bad luck would have [it] we met him again on his way to the ruins as he supposed we were not done. He has a garden in the Animas valley and went for potatoes. His man did not know where the cliff house was, and we were compelled reluctantly to give it up. We came yesterday, Wednesday, to the point 12 miles out from Animas City and today came through ready for our first cliff house tomorrow morning. We passed through a beautiful country in coming here today in some respects the finest we have seen. On our left (the north to our right), are the La Plata Mountains with long and beautifully green ascending slopes. We followed the La Plata river to near Parrott City where it emerges from a gulch in these mountains. We passed through Thompson Park, a very fine park. The grass was

[24] Samuel Beach Axtell (1819–1891), governor of New Mexico from 1875 to 1878.

fine. There are a few settlers scattered through this region. There will in time be many. The display of scenery interested me because it was the subsidence of the Rocky Mountains and the appearance of the mesa formation. We saw in some cases the mesa in two lifts one above the other, sitting back against the base of the great mountains, and on our left or southward the mesa or upland plain level on top and with sides neatly graded ? was frequently seen. The Mancos river is small at this point, not quite as large as the La Plata after the latter is well started. The Mancos valley is fairly wide at its commencement, about three quarters of a mile. At this point it is wider and substantially level except immediately opposite our encampment where a mesa has formed rising 20 feet above the level on this, the east side. We saw on our way down the valley the remains of several single houses of cobble stone or cobble stone and mud mortar. Each was small, 20 or 30 feet long. Pottery also is found near them.

At Animas City I met Genl. Heffernan who lived in Albany—knew Lemuel Steele,[25] who married his wife at Schenectady. He called us into his house and gave us a large lot of pottery he had collected in the Mancos valley, in Montezuma valley and elsewhere. Today we met him again at Parrott City, where he gave us a letter to Mr. Gregor, near whose house we now are.

We reached the cliff house about noon or a little later, to which we went on horseback. Mr. John Gregor kindly went with us, and gave me his horse which had a better saddle than the one he road [*sic*]. We came back very tired but Fellowes and I got a diagram and measurements of the house.[26] The place is 12 miles down the river from John Gregor's house and on the northerly or westerly side. As we rode down the character of the valley changed and narrowed until it became a canyon some three or four miles before we reached the place. The trail was 50 feet above the river where we came in sight of the place. The great overhanging cliff was very conspicuous; but a small part of the Indians' work was visible, about two or three feet of the highest part. The discovery must have been purely accidental. Last spring of the present year by Mr. Gregor in company with Gov. Axtell of New Mexico. Gregor's ranch extends down the valley below the cliff house and we went down on the ranchman's trail. I think he said the canyon widens out again below into a valley. At this point the two cliffs are about 300 feet apart and the house is about 200 feet above the trail and about 250 above the river. There was but little cliff visible above from our point of view, but

[25] Lemuel Steele, an Albany business man, was Morgan's father-in-law.

[26] This was the cliff house described by Wm. Fellowes Morgan in his paper before the American Association for the Advancement of Science (Proceedings of 1878).

it must be several hundred feet below the level country above. Those who occupied this house as a place of safety must have had to do with the country above and not with the canyon of which they could make no use. Mr. Gregor runs his stock down lower in the winter because the snow is light and the winter is warmer below than above. He and three other persons concerned with him have 1500 cattle in this river ranch, a very secure one because they keep above the canyon and they have eight or ten miles of good pasture land. We found corn cobs and pottery at the cliff houses which, with the houses, show very plainly that the builders were Village Indians of the New Mexico type. At the lower end of the site around some loose stones fallen together in a circle there is a mass of dung manure about ten inches thick, showing that the building was occupied since the period of European discovery. This dung may have been of goats or horses, or both. It was not impossible to lead even horses from our trail up to the place under the great overhanging cliff where the house was found.

We will now reproduce the plan and measurements. [Little sketch here.]

The formation is a soft yellow sandstone which has fallen in immense blocks, some of them near 20 feet square and thick. The house stands under an overhanging cliff which measures 140′ long by 40′ wide and 25 or 28 feet high along the outer edge. The masonry reaches the roof along the inside only, about 8 or 10 feet out. The roof is washed or scooped out with great regularity giving a level site for the house with a mass of boulders and rubbish outside of it rising above the level of the floor. The house contains 9 rooms, and five of these have a shallow basement now which may have been six feet high. [On the next page there is a sketch of the cliff house.]

Rooms No. 1, 2, 3, 4 and 5 had 2 stories, the lowest not over six feet high apparently. They were full of debris. The place where the floor timbers were inserted in the walls were plain to be seen. Each room had a doorway and one or two openings for light. These last were about a foot square. I have mentioned the measurements of the doorways. I also brought away a sample of the stone used in the wall, a thin piece of sand stone from the cliffs. The stone was not laid in courses, but stones of different sizes were mixed together irregularly. Stone lintels or caps and also bases were used in a few cases. They are as wide as the wall, but thin, about an inch or inch and a half. I was quite interested in this as it is unusual. In one of the lower rooms we noticed a stone step set in the wall and projecting about 6 inches. [Small marginal sketch here.] A trap door probably existed in the floor at this point, and if the rubbish had been removed other steps would have been found below this one.

The wall rises to the ceiling of the cave in some part of the first row of rooms. Next to the rock wall was a hall 64 feet long which is the exact length of the house.

The cliff ceiling of the cave is bare rock in one great mass forming a natural arch strikingly regular, and arching above from the base outward and upward. An efflorescence, perhaps of soda, of white powder stands in places on the roof. It is light and flaky. I put up some to find out what it is. The floor of the place is covered with it.

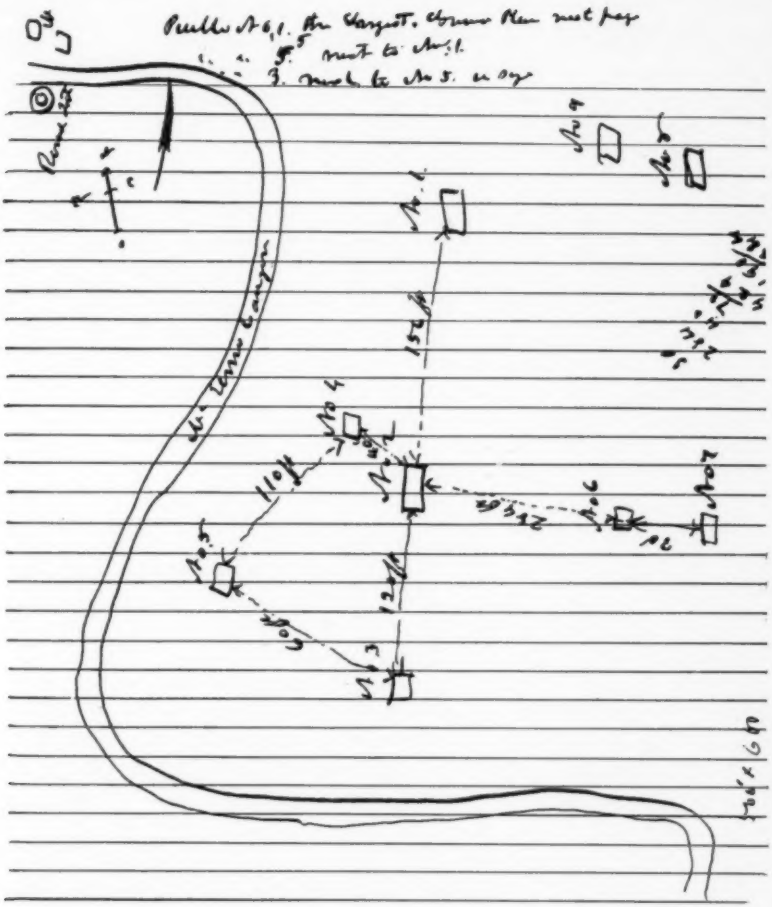
A mass of loose rock lies on the bank and rises above the level of the floor. The whole space which might have been used as a fort extended beyond the face of the upper cliff. There were no external walls to these rooms shutting up the whole structure except at the ends. It was open on the face and at the ends. Cobs were found, 4 in number, by Fellowes. Large numbers were found at first, as Mr. Gregor informed me.

They could not have cultivated in the canyon. In the valley four miles above they might have cultivated, but could not irrigate.

This may have been a winter lodge as the winter is warm. Those who lived in this house had more to do with the country above and not with the valley. No place has been found showing cultivation in the valley below Gregor's. It seems probable that this cliff house was a granary where they hid away and watched their corn, beans and squashes harvested.

Head of McElmo Canyon, July 27, 1878.

We have now reached our most western point at the house of Henry L. Mitchell. It is at the head of the McElmo canyon and about ten miles down the Montezuma valley which extends to the San Juan 36 miles. At this place are the ruins of no less than 10 pueblos in ruins within a mile square, and I think within half a mile square (Pl. I). Cliffs of yellow sandstone a little harder than that on the Mancos border the valley on the east side and furnished the materials for their houses which were of stone as is plainly to be seen. All these pueblos are small, but they are joint tenement houses of stone and undoubtedly outside and in of stone. The outline of the ruins can still be seen, but without digging they cannot be shown except here and there. The mound of stone and adobe mortar over the largest of these structures is from ten to twelve feet in the highest part. Entire rooms are thus either covered over entire or filled in some two or three feet above the original first story. The stone are flat pieces of sand stone two, three, and six inches thick and from six to twelve inches long. The mass of materials as they lye [*sic*] in a heap look precisely like that in the great pueblos on the Animas where we have stone walls outside and in.



Page from Morgan's journal of a trip to southwestern Colorado and New Mexico, showing his sketch plan of the arrangement of the group of ruins described under date of July 27, 1878.

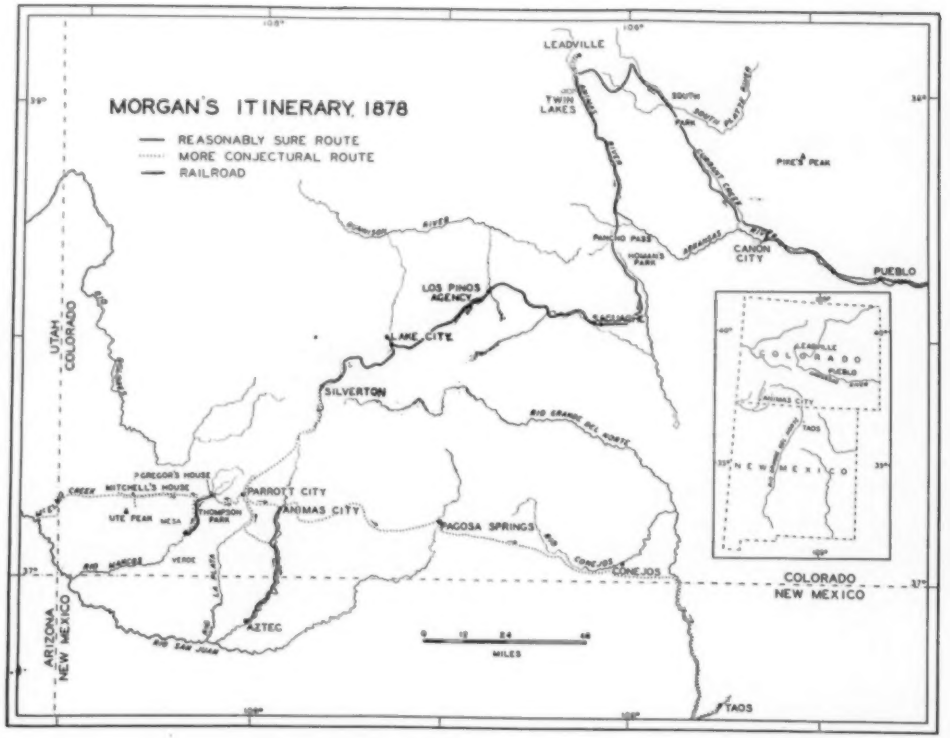

MORGAN'S ITINERARY, 1878
REASONABLY SURE ROUTE
MORE CONJECTURAL ROUTE
RAILROAD
LEADVILLE
TWIN LAKES
ARKANSAS RIVER
SOUTH PARK
SOUTH PLATTE RIVER
PIKE'S PEAK
CURRANT CREEK
PUNCHO PASS
HOWARD'S PARK
ARKANSAS RIVER
CANON CITY
PUEBLO
LOS PINOS AGENCY
LAKE CITE
SILVERTON
RIO GRANDE DEL NORTE
UTAH
COLORADO
GUNNISON RIVER
GREEN RIVER
GREGOR'S HOUSE
MITCHELL'S HOUSE
PARROTT CITY
THOMPSON PARK
UTE PEAK MESA
ANIMAS CITY
PAGOSA SPRINGS
CONEJOS
RIO MANCOS
VERDE
LA PLATA
AZTEC
RIO SAN JUAN
ARIZONA
NEW MEXICO
COLORADO
NEW MEXICO
TAOS
MILES

FIG. 1

Annexed is a rough diagram of House No. 1 which is the largest of the 9 but not much larger than two of them. The plan is conjectural as we had nothing but the pits to indicate the rooms. The external [here is shown a fine floor plan of the ruin] measurements were made with a tape line. The distance between the ruins, 9 in number, in first diagram were paced off and may be considered approximate as also the outline of the McElmo canyon. Out on a mesa elevation on the opposite or eastern side of the valley there are ruins of still other pueblos. This is a great valley about 7 miles wide just above here, with the well known Ute Mountain southwest of us about 10 miles off but seeming 3 or 4. This mountain is a conspicuous feature of the landscape at this point. Next to it is the range of high bluffs of the easterly side of Montezuma valley, about 1500 feet high with ? summits. This great and striking valley has no water or stream of water in it. But Mr. Mitchell has a pool of water precisely where the aborigines maintained a still larger pool by means of a wall quite near to the walls of the McElmo Canyon. There is also a small spring reserved for family use. The McElmo Canyon commences near Mitchell's house on which stands one of the round towers with a double wall described in one of Hayden's reports and figured as I think. I measured it in its tumble down state. The external wall which is round is 34 feet in diameter. From the outside of the inner wall to outside of same 25′. Width of outside wall 2′6″; cross wall 1′8″. [Diagram of circular walls.] They call the McElmo Canyon an arroyo for the first mile where it is about 100 feet wide, and the side walls 10 to 15 feet high. Below a mile it widens into a valley two miles wide. It turns to the right of the Ute Mountain and runs in to the San Juan, while the Montezuma Valley passes on the left or opposite side of the Ute Mountain and runs also to the San Juan higher up.

FIG. 1

A mile below here is a cliff house in the McElmo Canyon which we are to see in the morning. There is also a pueblo in ruins 3½ miles below here which we are to see in the morning. It is of stone and the largest in this vicinity.

Mr. Mitchell and myself went down the McElmo arroyo one mile the morning after our arrival and examined the cliff houses. The low cliff 20 feet high perhaps was eroded very much like the Mancos cliff, but not so long, deep, or high. There are two houses or rooms in the cavity. The first one was small and the masonry still standing; the other was larger but the walls had fallen. The cavity used for the house or store house, whichever it may have been, was not large. The most important fact concerning it was the presence at the upper end of a species of corral for animals, probably goats or sheep, where animal manure a foot or more thick was found. Mr. M. who examined it carefully pro-

nounced it the excrement of goats stating that there was nothing to show that it was goat manure rather than that of sheep or horses. He said there was no doubt it was animal manure. It shows, not that these houses were built after European discovery, but that they were occupied long afterwards. The Navajos ought to know about this place.

Mr. M. also showed me two places which late explorers called Indian burial places, one near his house and one half a mile below it. It is a row of stone now level with the ground arranged in a parallelogram thus. [Little sketch here.] About ten feet long and seven ft. wide. There are a number of them near or in the vicinity of the numerous pueblo houses in ruins near his house. They had not opened any of them. We had heard of another stone pueblo in ruins five or six miles up the valley at the ranch of Mr. Shirt on the other side of the valley from that we described and there are large numbers of graves to be seen there with head stones and foot stones in our fashion. On my return to Animas City I mentioned this fact to Gen. Heffernan and Capt. Ben Ford who called upon us in the evening at our tent, when Mr. Wade said he had excavated one of them at Shirt's ranch and found a skeleton and some earthen dishes. He said the skull was still perfect and at Shirt's ranch they both promised to excavate another this fall and send me the find in toto as freight by railroad. I encouraged them to do it and that if they were really burial places as this seemed to prove the greatest find relating to this lost people were here. Mr. White informed me of these burial places on the Mancos near Mr. Gregor's where we spent the night. But as I had never heard of pueblo or other tribes marking the site of graves except by a mound I did not attach as much importance as I should perhaps to the statement.

Mr. Heffernan named the Montezuma Valley.

The Ute Mountain which we have noticed far to the westward (?) is thus the boundary corner of four states and Territories, Utah, Colorado, Arizona and New Mexico. The San Juan passes around its base on the southwestern side. The Montezuma Valley runs across from the San Juan above the Ute Mountain to the San Juan below it, keeping the Ute Mountain in the elbow and the McElmo Canyon also passes on one side of it. We started early July 28 for the site of a large stone pueblo four miles below Mr. Mitchell's house in the Montezuma Valley and on the easterly side and under the shadow of the Ute Mountain. It is an immense ruin but with very little of the masonry standing, not enough to make a ground plan with any approach to exactness. One of the remarkable facts about it is the round tower with *three* concentric walls incorporated in the pueblo as a part of it. Two stories are in part standing the highest part of the walls rising about 15 or 18 feet above the ground.

Ruins of Pueblo in Montezuma Valley near Ute Mountain 4 miles below commencement of McElmo Arroyo. [Here is a diagram of the plan of the pueblo ruin.]

The wall of rock on which the pueblo stands is about 20 feet high, from which it stood back about ten feet. It was 3, 4 and 5 stories in height apparently in different parts of the building as shown. The highest part was near the cliff, the fallen stone filling all the space to the edge of the cliff. A break in the rock used as a reservoir for water separates the two buildings. The whole length of the front is 630 feet and the whole exterior development of the structure is more than 1500 feet. The pits of the several rooms are quite distinct and the debris rises from 12 to 15 feet high. I think an excavation would show the walls of the first story entire and the commencement of the second. All the walls visible ? the circular tower and one wall on the end near the canyon or cistern. On the opposite side of this break where the cistern or pool was formed another structure commences which forms a part of the whole. No walls are in sight but the pit holes are plain. I think the whole front is about in line although not so shown in the diagram. The greatest mass of debris or fallen material is next to the cliff. An excavation here would show the basement rooms nearly entire.

Near the end of the main structure to the right a portion of the cliff wall about 20 feet square broke out and fell over on the plain below carrying with it so much of the structure as rested upon it which then fell or slid off as may yet be seen. It may have occurred after the pueblo was abandoned.

In front of the vertical cliff on the level summit of which the pueblo stood are the remains of three houses or apartments the highest of which, probably two stories high, rise to the level of the flat top of the rock. They just filled the space between the two projections in the rock.

The round tower, here a part of the pueblo, suggests the donjon of an old castle, which would be hard to take after the pueblo was captured. It was built of stone, most of them about six inches square, laid as near as they could do it in courses. Some were a foot long, level top and bottom but the ends not squared. They were the sand stone which borders all these tributary rivers of the San Juan, the same found upon the Mancos at the cliff house where it is softer. It is found in the Montezuma Valley, in the bluffs, the Mancos, the La Plata, the Animas, the river of rivers, and along Rock river where July 31 we are now encamped. We have seen it in the hills and bluffs on our entire journey. It is an easily worked stone by mere fracture with a stone maul which is probably the only implement used.

Mr. Mitchell showed me a place where he thought they had baked their pottery and another where they made it. Salt weed grows here in

places near the ruins. The land where it grows Mr. M. says is right for pottery and for adobe mortar.

Pagosa Springs, San Juan River, August 2, 1878.

We reached these springs last evening. They are boiling hot sulphur springs, large and copious and clear. They are on the east side and quite near the river. The basin is a large one 30×15 feet and deep. The sediment from the water has it would seem formed the honeycombed rock around the spring and the great bed along the margin of the river for more than a quarter of a mile and an eighth in width. Fissures run through it and it is full of cavities in which the water is seen (?) to run. Pools of it come out at low places and stand while a small stream runs from it. The main spring is too hot to bathe in. You cannot bear your hand in it. Its temperature is not known to the few white men there. The water boils up violently in three or four places, and gas rises in places all over the basin. Water boils at this elevation I think at 196°. The spring may or [may] not be 212°. Near the river a large stream is discharged over the bank. The people have deepened out the place and stoned it up along the river bed; so that hot water is constantly running into this large bathing tub which is hot at the upper end and cool at the lower. We did not bathe as the day was cloudy threatening rain. You see the spring long before you get to it by the steam rising over it in three or four jets. In the fall cool weather it is most conspicuous and rises higher.

The San Juan river which we here saw quite near the mountains interested me a great deal. We were near the head of the valley. Ruins are found a few miles below Pagosa Spring. This is the great River of the Village Indians. It has a remarkable series of tributaries, all of which we have crossed or traversed up and down. Beginning on the east we have Rock river (Rio Piedra), Pine river (Los Pinos), Animas, La Plata and Mancos. The Montezuma valley intersects it twice. It has occurred to me that the San Juan was not only the Aztlan of the Mexican tribes, but the native region of corn.[27] The plant life of the Rocky Mountains has amazed me because it was unexpected. Flora in endless

[27] See Morgan, 1880*a*, pp. 550–556, and 1881, pp. 192–197, for Morgan's conception of the place of the San Juan region in aboriginal American culture history. It is interesting to note today, sixty-four years after Morgan's trip, that in the San Juan region we have a complete series of stages of cultural development from the beginnings of agriculture to the highest development of Indian culture in North America. And the San Juan does "indeed, appear to have been the breeding ground and place of dissemination" (Kidder, 1924, p. 123) of Pueblo culture (*ibid.*, p. 125). Morgan's theory that the cultures of the Southwest have greatly influenced those of the eastern United States is not at all un-

variety have met us at every point of our course and particularly upon the tributary rivers of the San Juan. We have also met the cereals growing wild or by self propagation. We saw the oat everywhere. We have also seen rye and barley a number of times. We have also seen corn in one case growing by the side of the road, of course by accidental planting. The onion and turnip grow wild on the River of Pines as a resident assured me. Corn also sows itself and grows on Pine river, as the same person informed me. Flax grows wild on the Animas near the Cascade mountains and also on the Pine River from which I have a specimen. It grows through the San Juan river country. Currants, cherries, gooseberries, raspberries, strawberries, tomatoes (Pine River) Pie plant (Elk Mountains) hops (Pine River). I have also found the pea, either the domestic pea or the wild one.

The San Juan country is a dry country. The New Mexican corn is hard and dry and the stalk short. This must have been the original corn. In dry San Juan, such corn when sown by itself, would propagate itself from year to year while it would [not?] be the case in New York or Iowa or Central America. It is not improbable that corn, the gem of the great cereals, originated in the Rocky Mountains and then was propagated and differentiated on some of the rivers named, all of which including the San Juan itself, originated in these mountains. This conjecture is worth further development.

Camp near Conejos, Aug. 4, 1878.

We passed yesterday a camp of about 250 Utes on Navajo river. They had canvas tents of the Dakota form and about 300 horses, perhaps more. The tents were about 30 in number. Henry Waller, our wagon man has a Sioux wife and has lived among the Dakotas. He showed us today how they fixed their tent poles. First they take three poles and tie them together at the top, leaving a long rope at the end of the tie. They then put two poles between each pair making six additional poles. Two are added for the door and two for the flares, making 13 poles in all. The thing is then wound around the poles standing on the ground, and fastened to a stake in the ground, so as to leave the flare poles to windward. The skin cover is then put on and tied down

reasonable today. On the contrary, the nature and extent of this influence is a matter which may well attract more attention in the next decade than it has in the past.

With regard to the origin of cultivation of corn, there is no wild grass in the Southwest today from which corn might reasonably be supposed to have developed. But the theory of an origin in southern Mexico appears to be untenable also at the present time. The fact is that today we know but little more about where maize was first cultivated than Morgan did.

with tent pins. This Dakota lodge or tent is now in general use among the Indian tribes who live in tents.

Taos, August 7, 1878.

At last I find myself at Taos which is 80 miles south of Conejos and 75 north of Santa Fe. The two edifices are connected on one side by a wall, and on the other not. The cacique is old and blind. He and the governor received us kindly. There are 3 estufas [kivas] connected with each building. They are round and below ground.[28] We entered one of them descending by a ladder. We visited a number of rooms in each house, saw their manner of life and found a number of ? of each family; one family consisting of a husband and wife and one son had two upper rooms and two lower rooms under and two lower rooms in front below. They lived in the two upper rooms, the others being used for storage. The living rooms are spacious and clean, but we found some small and low. Another family had 3 rooms, one above and two below. Another 3 as last, another two rooms, one above and one below.

When a man dies leaving a wife and children and apartments and other property it is divided equally between the wife and children and the same on the death of the wife.

These Indians are well off in land with a fair creek of cold sweet water flowing between the two houses. There is one main ditch or canal on each side and a number of smaller ones. They cultivate a good deal of land by irrigation and in good years must have large crops of corn, wheat, peas and beans. For three years they have had poor crops, while this year promises well.

It is now evening, and as we are now encamped close by the pueblos, we hear the boys singing, dancing ?. They are Iroquois all over. I am going out to be on the spot.

The Taos Indians have 15 dances and more;[29] namely the War Dance Home-ta-na, 2. Wä-nä-ke-ah-na, Scalp dance in which women join; 3. Ah-hä-tä-na, Turtle dance. 4. Ah-hä-tä-na, another Turtle dance. 5. Tä-ha-tä-na, Ute dance. 6. Ah-ya-tä-na, Beaver dance. 7. Tä-nä-po-ah-na, Pipe dance. 8. Pä-nä-tä-na, Pawnee dance. 9. Ku-wa-tä-na-po-nä, Apache dance. 10. Kool-tä-na, Drum dance. 11. ? ue-ah-uit-tä-na, Navajo dance. 12. Pa-tä-na, stag dance (dressed up as deer). 13. Kon-tä-na Buffalo dance. 14. Tu-ta-na S—et dance or Elk dance. 15. Oo-nä-hä-na Pueblo dance. 16. Koo-yu-la-tä-na Pole cat

[28] Taos kivas are today as they were in 1878. It is not too much to assume that the present kivas are the very ones that Morgan saw.

[29] Cf. Parsons, 1936, p. 83 et seq. Many names recorded by Morgan are identifiable in Parsons.

dance or Skunk dance. All these are costume dances. 17. Hen-dä-na Lion dance. 18. Chu-tä-na Eagle dance. 19. Con-tä-na Little horse (pony) dance. They use drum, the squash shell rattle, turtle shell rattle which they tie below the knee, a kind of wind instrument. They also have singing in each dance.

Men do all the field work. Women and men go to town together but the women do the trading. We met a man and woman this morning 4 miles from the pueblo, the man on horse and the woman on foot.

We have purchased quite an amount of pottery and stone implements, particularly the boys. It is not made at Taos at present but at San Juan and sold to them. I have purchased a number of specimens. The black color used in ornamentation is from the plant[30] wha-o-na from which they extract the juice. White and yellow are from white and red earth and the red from red clay, so that all these colors are mineral but one.

The Pueblo women are not bad looking and very pleasant. They have brought and sold much of the wares. Their dress is still Indian, a frock loose about the neck, leggins, moccasins and blanket.

The buildings are not quite as large as I expected. Neither story is over 10 feet high and there is a parapet wall at each flat roof. The ovens in the court are numerous, but not one for every family. A person builds one and loans use of it to others. A person bakes and gives a portion to others who are in need.

BIBLIOGRAPHY

ARCHAEOLOGICAL INSTITUTE OF AMERICA
1880. *First Annual Report of the Executive Committee.*

FEWKES, J. W.
1909. *Antiquities of the Mesa Verde National Park.* Bureau of American Ethnology, Bulletin 41. Washington.

HADDON, A. C.
1910. *History of Anthropology.* London.

HOLMES, W. H.
1878. "Report on the Ancient Ruins of Southwestern Colorado, Examined during the Summers of 1875 and 1876." *U. S. Geological and Geographical Survey of the Territories.* Washington.

JACKSON, W. H.
1876. "A Notice of the Ancient Ruins in Arizona and New Mexico lying about the Rio San Juan." *Bulletin of the U. S. Geological and Geographical Survey of the Territories,* Vol. 2, No. 1. Washington.
1878. "Report on the Ancient Ruins examined in 1875 and 1877." *Report of the U. S. Geological and Geographical Survey of the Territories.* Washington.

[30] Undoubtedly the Rocky Mountain Bee Plant, *Cleome serrulata.*

KIDDER, A. V.
1924. *An Introduction to the Study of Southwestern Archaeology.* New Haven.

LOWIE, R. H.
1936. "Lewis H. Morgan in Historical Perspective," in *Essays in Anthropology Presented to A. L. Kroeber.* University of California Press, Berkeley.

MORGAN, LEWIS H.
1869. "Seven Cities of Cibola," *North American Review,* Vol. 118, pp. 457–498.
1871. *Systems of Consanguinity and Affinity of the Human Family.* Smithsonian Contributions to Knowledge, Vol. 17. Washington.
1880*a*. "On the Ruins of a Stone Pueblo on the Animas River in New Mexico; with a Ground Plan." *Peabody Museum of American Archaeology and Ethnology, 12th Annual Report.*
1880*b*. "A Study of the Houses of the American Aborigines; with suggestions for the exploration of the ruins in New Mexico, Arizona, the valley of the San Juan, and in Yucatan and Central America." *Archaeological Institute of America, 1st Annual Report of the Executive Committee.* Cambridge.
1881. *Houses and House-Life of the American Aborigines.* U. S. Geographical and Geological Survey of the Rocky Mountain Region, Contributions to North American Ethnology, Vol. 4. Washington.

MORGAN, WM. FELLOWES
1879. "Description of a Cliff House on the Mancos River of Colorado; with a Ground Plan." *American Association for the Advancement of Science, Proceedings of 1878,* pp. 300–306.

MORRIS, EARL H.
1919. *The Aztec Ruin.* American Museum of Natural History, Anthropological Papers, Vol. 26, Part 1.

NORDENSKIOLD, G.
1893. *The Cliff Dwellers of the Mesa Verde.* Translated by D. Lloyd Morgan. Stockholm.

PARSONS, ELSIE CLEWS
1936. *Taos Pueblo.* General Series in Anthropology, No. 2.

POWELL, J. W.
1880. "Sketch of Lewis H. Morgan." *The Popular Science Monthly,* Vol. 18, pp. 114–121.

STERN, BERNHARD J.
1931. *Lewis H. Morgan: Social Evolutionist.* Chicago.

WHITE, LESLIE A., Ed.
1937. *Extracts from the European Travel Journal of Lewis H. Morgan.* Rochester Historical Society Publications, Vol. 16.
1940. *Pioneers in American Anthropology: the Bandelier-Morgan Letters, 1873–1883,* 2 vols. University of New Mexico Press, Albuquerque.

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IMPLICATIONS OF THE MOGOLLON CONCEPT

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NEARLY sixty years ago, the wife of a territorial governor of New Mexico was among the first to recognize that ruins of the Southwest represented, not a vanished and mysterious race, but the ancestors of the living Pueblo Indians, and added: "from the sameness of the remains I infer that no important facts are to reward the search of dreaming pilgrim or patient student."[1]

In the half-century since, patient students have ferreted out many facts of interest and possibly of importance, and have found that the sameness of the remains is not complete. The gradual recognition of successive periods of sequential development, their confirmation through stratigraphic studies, and the working out of temporal classification or horizontal segmentation, culminating in the Pecos-Roberts classification, is a familiar story.

Until ten or twelve years ago, the interest in thus establishing and elucidating the temporal succession of general periods completely overshadowed the occasional recognition of important inter-areal differences, notably of the distinctiveness of the culture of Chihuahua and of that of the Gila region.[2] The comparative lack of scientific investigation in the southern and western portions of the Southwest after the beginning years of this century produced neglect of these "outlying" areas in theoretical studies and reconstructions, which for a generation emphasized the upper San Juan area.

In the same way that division in time, separation of periods, in southwestern archaeology was slow to reach full understanding and general acceptance, vertical segmentation, or spatial classification by cultural continuity, emphasizing differences between areas and unities within areas over long ranges of time, as against differences between periods and similarities within each period over a wide area, has occurred almost within the past decade,[3] and is not yet wholly accepted.

The separateness of the Hohokam culture of the southern Arizona desert from the Basketmaker-Pueblo or Anasazi sequence of the plateau and, at least to some extent, its considerable antiquity, were fairly demonstrated at Snaketown[4] and are now generally accepted.[5]

[1] Wallace, 1888, p. 27.

[2] E.g., Mindeleff, 1896, pp. 179–261, 186–187; Kidder, 1924, pp. 105–107, 111–112 (lower Gila), 115–117 (Chihuahua), 128; Kroeber, 1928, pp. 378–380.

[3] Culminating, to date, in the Gladwin-Colton classification; see Colton, 1939*b*.

[4] Gladwin, Haury, and Sayles, 1937, reviewed by Martin, 1939; Vaillant, 1939; Noguera, 1938.

[5] Roberts, 1935, pp. 16–20, 28–31; 1937, pp. 15–21, 28–31; and 1939, p. 14; Kidder, 1936, pp. 590, 592, 595; Morris, 1939, pp. 1, 248.

A third major subdivision of prehistoric remains in the southwest, recognized as a probably separate entity at least as early as 1934 under the general phrase "southwestern brownware complex,"[6] a branch of which was soon thereafter designated by the Gila Pueblo workers the Mogollon culture,[7] has not yet fully attained legitimacy in the view of the more conservative southwesternists and is suspected of miscegenetic descent as a "culturally peripheral" (though geographically centrally located) group of complexes, leaning now toward Hohokam, now toward Anasazi.[8]

A fourth pattern tentatively recognized, the Patayan (or "Yuman," as originally called by Gladwin) of the western Arizona desert[9] is hardly even considered an illegitimate of doubtful parentage, only barely accorded mention, by this same school of thought.[10]

The distinctions between Hohokam and Anasazi patterns have been adequately published.[11] Those between Mogollon and the above two have been recently discussed.[12] Distinctive or diagnostic Patayan traits have not been formally listed, but the characteristics of the group as now set up have been outlined.[13]

Complexes as far east as the Pecos valley[14] and as far west as the Verde valley and the vicinity of Flagstaff[15] have been considered by various workers to be affiliated to the Mogollon complex. Other southwesternists have questioned this, and some have denied the separateness of Mogollon from Anasazi.[16]

Much of the apparent controversy is due to lack of definitions, to lack of agreement on, and clarification of, terminology, and in part specifically to confusion of a broad "Mogollon" *concept* with the individual *complex* originally so named. No really objective definitions of "Pueblo," "Anasazi," or "Mogollon" have appeared; nor have the parties to the controversy clearly defined what they mean by "separate" and "not separate." And finally, the question of antiquity is distinct from, though of course related to, the question of "separateness."

The "radical" or Mogollonist viewpoint has recently been well

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[6] Mera, 1934, p. 7. [7] Haury, 1936; Gladwin and Gladwin, 1935.

[8] Judd, 1940, p. 433. See also Roberts, 1937, pp. 4, 21–25, 30–31; 1939, pp. 5, 15–16. More liberal than Dr. Roberts' cautious statements is Morris, 1939, p. 248.

[9] For references see Reed, 1938, p. 97; later publications include Colton, 1939*b*, *passim* to p. 21 and pp. 22–32, and 1939*a*.

[10] Judd, 1940, p. 434. There is no mention in Roberts, 1939.

[11] See especially Gladwin, Haury, and Sayles, 1937.

[12] See especially Rinaldo, 1941; and Haury, 1941, *passim* and especially pp. 121–131.

[13] See especially Hargrave, 1938, pp. 48–49; and Colton, 1939*b*, Ch. 7.

[14] Jennings, 1940. [15] Colton, 1939*b*, pp. 33–46.

[16] Nesbitt, 1938; Kidder, 1939*a* and 1941.

stated, however, in a conservative and objective fashion by Colton, who points out that the early culture complexes of the forested upland zone from Flagstaff to the Mimbres appear to be interrelated, at least ceramically; and appear to be recognizably different from typical Anasazi as well as from Hohokam; that, therefore, the "Mogollon root" is a useful working concept.[17]

The primary purpose of the present paper, however, is not to attempt to establish the validity of the "Mogollon culture" or to argue for or against its relative antiquity, but to assay the effect of the Mogollon concept on southwestern archaeological thought.

The belief that Anasazi culture developed relatively independently, virtually uninfluenced from neighboring areas, or that the upper San Juan was the hearth and focus for the development and distribution of Southwestern culture and of major cultural traits, other districts of the Southwest being "peripheral" and backward, was also an hypothesis: a perfectly good working concept but, nevertheless, lacking complete demonstration and certainly not the accepted fact which, like many other theories, it was rapidly becoming.

Surely it is fully as scientific to select the hypothesis that the material referred to as Mogollon may represent a development at least as important and as ancient as the better-known material further north, and to proceed on that basis, as it is to deny this possibility and cling determinedly to the San Juan hypothesis. When of two somewhat similar cultures one is well-known and accurately dated and the other is not, it is rather rash to affirm, before exploring the second thoroughly, that the familiar one is the older and more basic. True, the opposite is also rash. The point is, that denial of a possibility or hypothesis is no more conservative than prematurely asserting its validity.

A recent statement referring to a distant area is apropos here: "the Guatemala highlands . . . would seem to have been a meeting and mixing ground, rather than a mother of culture. But . . . it should be remembered that this is often one's first impression of a little-understood area lying between regions whose remains are better known. In any case, however, there can be no question regarding the outstandingly great importance of highland archaeology, nor as to the need for its more intensive investigation, with a view to more precise definition of the content and geographic range of cultures of all periods."[18] By the single change of replacing "Guatemalan" by "Southwestern," this statement applies excellently to the Mogollon problem.

The question of Mogollon separateness, if considered without refer-

[17] Colton, 1940. [18] Kidder, 1939*b*, p. 124.

ence to the problem of relative antiquity, is simply one of definition. Obviously, the material called Mogollon is very similar generally to that called Anasazi; these two form one group as against remains from areas other than the Southwest, and also as against the Hohokam culture. Yet there are numerous differences of detail (mainly in pottery). The degree of separateness can readily be stated in terms of specific trait differences. Whether they are comprised under one head as subdivisions of "Puebloan" or are referred to as two separate developments is a matter of taxonomy.

One group of workers notes that the pottery differs radically between the two groups of sites, and calls them "separate cultures." Other students feel that the broad similarity in pattern and the specific similarity of certain artifacts are more important than the ceramic distinctions, and say: "a single culture." This is futile and meaningless until the two groups agree on the criteria of "a culture"—after which no argument is imaginable.

The question of relative antiquity is a different sort of argument, not dependent on the taxonomic question. If all the material in question is grouped as "Puebloan" (contrasting with Hohokam, or Gila-Sonora), the Mogollon type and Anasazi type being called subdivisions of Puebloan, it is still just as possible that the earliest Puebloan remains are in the south and of the variety called Mogollon, rather than in the San Juan several hundred miles further from the apparent centers of advanced culture traits in North America; are of a type so generalized as to have been thought by some a hybrid of Hohokam and Anasazi, and at one time by others an intrusion from the plains, rather than of a group highly specialized and unusual.

The case for the considerable antiquity of the Mogollon complex has been competently presented in this journal recently[19] and such specific evidence as exists need not be cited again. It seems important, however, to reiterate the fact that a certain amount of such evidence has been accumulated, and the conception, hypothesis, or working concept, of an early and basic Mogollon culture cannot be lightly dismissed as unfounded speculation.

A current conception of the pan-Mogollonist school has only once been clearly indicated in print: "In many respects it seems more logical (as against Hohokam origins for other southwestern culture) to think that southern traits present in the area might have been transmitted to both the Hohokam and the Anasazi through an early basic Mogollon group."[20]

Here is the essence of the Mogollonist viewpoint. The importance of the Mogollon concept is not merely that it relates specific finds or

[19] Rinaldo, 1941. [20] Roberts, 1937, p. 31. See also Haury, 1941, p. 131.

complexes in various areas to a specific Mogollon complex in southwestern New Mexico, but rather that it introduces another major factor, a possible culture source, and demands, more radically than did the elucidation of Hohokam prehistory, reorientation of basic notions and approaches in southwestern archaeology. It completes the breakup of traditionalist thought, the conception of the single center with its peripheries being replaced by several cultural areas or lineages with their separate sequences and interrelated history, a shift which in time should lead closer to an understanding of what actually happened.

Of especial importance, and potential value, is the effect of Mogollonism on the question of relationships between the Southwest and Mexico. Heretofore, it has been possible or, rather, unavoidable, to evade the issue by referring to probable but vague southern origins, with no attempt at exploration of actualities, and to refer to the great gap of several hundred empty miles. The Mogollon complexes and concept tie in with Mexican-Southwestern relationships, and tie down those relationships; or at least will inevitably lead to detailed examination of them and serious study of specific questions.

BIBLIOGRAPHY

COLTON, H. S.

1939*a*. *An Archaeological Survey of Northwestern Arizona*. Museum of Northern Arizona, Bulletin 16. Flagstaff.

1939*b*. *Prehistoric Culture Units of Northern Arizona*. Museum of Northern Arizona, Bulletin 17. Flagstaff.

1940. Review of P. H. NESBITT, *Starkweather Ruin*, AMERICAN ANTIQUITY, Vol. 5, No. 4, pp. 353–354.

GLADWIN, W., and H. S. GLADWIN

1935. *The Eastern Range of the Red-on-Buff Culture*. Medallion Papers, Vol. 16. Globe, Arizona.

GLADWIN, H. S., E. W. HAURY and E. B. SAYLES

1937. *Excavations at Snaketown*. Vol. 1, *Material Culture*. Medallion Papers, Vol. 25. Globe, Arizona.

HARGRAVE, L. L.

1938. "Results of a Study of the Cohonina Branch of the Patayan Culture in 1938." *Museum Notes*, Vol. 11, No. 6. Flagstaff.

HAURY, E. W.

1936. *The Mogollon Culture of Southwestern New Mexico*. Medallion Papers, Vol. 20. Globe, Arizona.

1941. *Excavations in the Forestdale Valley*. University of Arizona.

JENNINGS, J. D.

1940. *A Variation of Southwestern Pueblo Culture*. Laboratory of Anthropology, Technical Bulletin 10. Santa Fe.

JUDD, NEIL M.

1940. "Progress in the Southwest." In *Essays in Historical Anthropology of North America*. Smithsonian Miscellaneous Collections, Vol. 100. Washington.

KIDDER, A. V.
1924. *Introduction to Southwestern Archaeology.* New Haven.
1936. *Pottery of Pecos, Vol. II.* New Haven.
1939*a*. Review of P. H. NESBITT, *Starkweather Ruin, American Anthropologist* Vol. 41, No. 2, pp. 314–316.
1939*b*. "Archaeological Problems of the Highland Maya." In *The Maya and their Neighbors.* New York.

KROEBER, A. L.
1928. *Native Culture of the Southwest.* University of California Publications in American Archaeology and Ethnology, Vol. 23, No. 9.

MARTIN, P. S.
1939. Review of GLADWIN, HAURY and SAYLES, *Excavations at Snaketown,* AMERICAN ANTIQUITY, Vol. 5, pp. 176–180.

MERA, H. P.
1934. *Observations on the Archaeology of Petrified National Monument.* Laboratory of Anthropology, Technical Bulletin 7. Santa Fe.

MINDELEFF, COSMOS
1896. *Aboriginal Remains in the Verde Valley, Arizona.* Bureau of American Ethnology, 13th Annual Report. Washington.

MORRIS, E. H.
1939. *Archaeological Studies in the La Plata District.* Carnegie Institution of Washington, Publication 519.

NESBITT, P. H.
1938. *Starkweather Ruin.* Logan Museum Publications in Anthropology, Bulletin 6. Beloit.
1941. Review of P. S. MARTIN, The SU Site, AMERICAN ANTIQUITY, Vol. 7, No. 2, pp. 192–193.

NOGUERA, EDUARDO
1938. Review of GLADWIN, HAURY and SAYLES, *Excavations at Snaketown, Boletin Bibliográfico de Antropologia Americana,* Vol. 11, pp. 39–40.

REED, ERIK K.
1938. Note. *Boletin Bibliografico,* Vol. 11, No. 4.

RINALDO, JOHN
1941. "Conjectures on the Independent Development of the Mogollon Culture." AMERICAN ANTIQUITY, Vol. 7, No. 1.

ROBERTS, F. H. H., JR.
1935. "A Survey of Southwestern Archaeology." *American Anthropologist,* Vol. 37, No. 1.
1937. "Archaeology in the Southwest." AMERICAN ANTIQUITY, Vol. 3, No. 1.
1939. *Archaeological Remains in the Whitewater District, Eastern Arizona, Pt. I.* Bureau of American Ethnology, Bulletin 121. Washington.

VAILLANT, GEORGE C.
1939. Review of GLADWIN, HAURY and SAYLES, *Excavations at Snaketown, American Anthropologist,* Vol. 41, p. 139.

WALLACE, SUSAN E.
1888. *The Land of the Pueblos.* New York.

Santa Fe, New Mexico
September, 1941.

ARCHAEOLOGY AND THE RECONSTRUCTION OF HISTORY

HAROLD S. COLTON

THE principal aim of archaeology is the reconstruction of history. How archaeology plays this part is usually not very clearly thought out, although Rouse has made a good attempt.[1] In the reconstruction of history, we deal with human social units. These social units are composed of animals which reproduce their kind, inherit biological traits, mutate, evolve, take in food, give off waste products, react to their environment, die, and, in so doing, behave fundamentally like other animals. Moreover, the animals have a language, form part of a social pattern, have ideas of the supernatural and what we can call religion, and can manufacture certain objects in a certain way. These animals are grouped into families composed of mother, father, and children. They are further grouped into extended families, sibs, or clans made up of real or fancied relatives. A number of extended families under the leadership of one man or a group of men forms a political group. As an example, the individual Hopi pueblos are political groups, as well as those groups of Yavapai living in isolated mountain canyons as described by Gifford,[2] or the Maidu settlements, of the Northwest, described by Kroeber.[3]

A number of political groups that have in general the same social structure, the same language, the same religion and the same material culture, but may or may not be single political units we call a tribe; and it is the history of such tribes which concerns the archaeologist.

To develop this idea further let us examine a concrete case. We can observe that the Hopi Indian tribe is made up of the following political units: (1) Walpi and Sichomovi, (2) Mishongnovi, (3) Shipaulovi, (4) Shungopovi, (5) Kiakochomovi, (6) Oraibi, and Lower Moenkopi, (8) Hotevilla, (9) Bakavi, and (10) Upper Moenkopi. In this case, the tribe has little political function, being made up of independent political units with almost the same material culture, language, religion and social organizations. Ethnologists describe the characteristics of the Hopi tribe as it is known to us at the present time. Through accounts of Spanish travelers, we know that the tribe existed much as it is at present back to 1540. To carry the history of the tribe earlier than this date, the investigator can use archaeological methods.

When an archaeologist makes a list of the attributes of a prehistoric tribe, he is much hampered because so much has been destroyed.The animal body is reduced to a skeleton; the language has gone but can

[1] Rouse, 1939. [2] Gifford, 1936, p. 201. [3] Kroeber, 1925, p. 398.

sometimes be inferred; the material culture is reduced to objects that survive interment in moist earth, houses in some cases, pottery, stone or such perishable objects that happen to have been preserved in dry caves, or are preserved through being carbonized in a fire. Some types of social organization can be inferred by architecture but most have been lost. Some elements of religion can sometimes be recovered from burial customs, religious structures, and ceremonial objects. In general, however, our knowledge of the tribe depends on a very few of the elements by which an ethnologist would describe the tribe were it living today.

Since we know so little about the prehistoric tribe, it is better to use Gladwin's term and call it a "branch," and so to avoid using the name of a modern Indian tribe for the prehistoric unit, we will call the Hopi tribe the Tusayan branch. A branch as I see it, and as I think Gladwin visualized it,[4] is not simply a subdivision of a classification of culture. It includes much more than that because it is defined by all the surviving attributes of a prehistoric Indian tribe: (1) physical remains of individuals, (2) social organization, (3) religion, and (4) material culture. Material culture, because it is the best preserved and furnishes the greatest number of traits, has mixed up our thinking, causing us to consider that the Gladwin system of roots, stems, branches, phases, (foci), is a classification of cultures. It is not that, but a classification of prehistoric human groups.

After a branch is recognized, it can usually be segmented, according to some time scale. Where we have tree-ring dating, we can express these segments in years of our era. Where we have a sequence established, we can number them, letter, or name them. Numbers and letters have the mathematical property of position so, in series that are expanding by intussusception, that is from within, it is better to give the sequence names so that a newly discovered segment can be interpolated without upsetting the series, for a name usually has no positional significance.

These segments on a branch, we call foci after McKern rather than use Gladwin's term "phase." The reason for this has appeared in an earlier publication.[5] They are distinguished from the focus above or below on the branch by the differences in material culture traits, sometimes very slight. The branches are differentiated from each other by differences in traits persistent over a long period of time. Thus, the Sunset focus is distinguished from the Rio de Flag focus by very few minor traits, such as pottery designs and house details, while the difference in architecture between the Sunset focus and the Elden focus, farther up the branch, is enormous. Through the work of Hargrave at the pueblo of Kokopnyama and Brew at Awatovi, we can carry the Tusayan

[4] Gladwin and Gladwin, 1934. [5] Colton, 1939*b*.

branch back to 1300 with great confidence. The material culture traits that survived burial in moist earth are little different from the same traits of the historic period. To retrogress farther in the past is more difficult because the results of excavations in the earlier centuries in the Hopi country have not been published. From fragmentary evidence we can trace back the Tusayan branch to 500 or 600 A.D.

FIG. 2.—Map of Arizona showing region occupied by the Kayenta, Cohonina, and Sinagua branches during the ten hundreds A.D. (Tusayan and Winslow branches are included in the closely related Kayenta). Parallel lines indicate the Kayenta-Sinagua frontier, which was stable (700–1300 A.D.). The Sinagua-Hohokam frontier, on the other hand, was fluid: the Sinagua moved south (1100–1400 A.D.) at the expense of the Hohokam.

At no time was the Tusayan branch isolated. There were always neighboring tribes with which to trade ideas and objects. In the historic period, to the west of the Hopi lived the Havasupai, to the north, the Paiute, to the northeast, the Ute, to the east, the Navaho, to the

southeast, the Zuni, and to the south, the Apache, with all of which a lively trade took place and, sometimes, war. Some of these tribes, like the Zuni, had a great influence on the Hopi, while others, like the Apache, had but a slight effect.

In the prehistoric period 1000–1200 A.D., the Tusayan branch was also surrounded by other branches. The Cohonina branch and the Virgin branch[6] lay on the west, the closely related Kayenta branch, on the north, the Mesa Verde branch, on the east, the Cibola branch, on the southeast, the Winslow branch, on the south and the Sinagua branch on the southwest. With all these close contacts, it is remarkable that the recorded cultural traits were so persistent. Where diffusion occurred it showed only in minor elements such as decoration on pottery, a new ceremony, or an architectural detail. The basic pattern of life remained very constant, and methods of manufacturing objects, particularly those made by women, are the most persistent of all.

The Sinagua branch, which centered south of the San Francisco Mountains, and which has been well studied, illustrates persistence and diffusion.[7] From 600–700 to 1400 A.D., this branch, with minor variations, used techniques in the manufacture of pottery which contrasted sharply with those used by the adjoining Kayenta branch, whose territory was contiguous with that of the Sinagua for fifty or sixty miles. The potters of the Sinagua branch shaped their vessels with a paddle and an anvil and fired them consistently in an oxidizing atmosphere, while the potters of the neighboring Kayenta branch shaped their pottery by scraping and fired most of it in a reducing atmosphere. Side by side these two branches dwelt for six hundred years, and in pottery manufacture one had little effect on the other.

In architecture, on the other hand, we have a different story. Up to 1100, the Sinagua dwelt in rectangular earth lodges of timber, later of stone, while the Kayenta lived in oval or circular pit houses. In the nine hundreds, the Sinagua borrowed the idea of a ventilator from the Kayenta. In the late 1000's, the Kayenta built masonry pueblos; the Sinagua copied them. Although they borrowed certain architectural traits, they seem not to have borrowed the kiva, which shows that the two branches had different religions. Religion is very persistent and is one of the elements of culture most resistant to change.

Thus, we have the persistence of certain traits and diffusion of others.

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[6] Gladwin, in 1934, proposed the name Nevada branch for the prehistoric group that occupied the Virgin drainage and neighboring regions in Utah and Nevada. As the name of a large state for a restricted group is misleading and as Gladwin's name has appeared very little in the literature, I suggest the name Virgin branch be substituted.

[7] Rouse, 1939, p. 14. Also Museum of Northern Arizona, Bulletins 17, 18, 19.

This diffusion and persistence of traits over the Kayenta, Sinagua border can be summarized as follows:[8]

1. The traits of the Kayenta and Sinagua which did not diffuse are: (a) earth lodge shape, circular or oval in Kayenta, rectangular in Sinagua; (b) two post roof support absent in Kayenta, present sometimes in Sinagua; (c) ball court absent in Kayenta, present in Sinagua; (d) sipapu present in Kayenta, absent in Sinagua; (e) method of shaping pottery, scraping in Kayenta, paddle and anvil in Sinagua; (f) axes, full groove in Kayenta, three fourths groove in Sinagua; (g) black pottery paint present in Kayenta, absent in Sinagua; (h) firing atmosphere reducing in Kayenta, oxidizing in Sinagua; and (i) inhumation flexed in Kayenta, extended in Sinagua.

2. Traits that seem to have diffused from the Kayenta to the Sinagua, 900–1100 A.D., across the border are: (a) ventilators; (b) deflectors; and (c) good masonry construction. After 1100 the masonry, multifamily pueblo was accepted by the Sinagua.

3. No true Sinagua traits seem to have crossed the border to the Kayenta between 900 and 1100 A.D., although the barb and serration (lightning) design on pottery diffused from the Hohokam to both the Kayenta and Sinagua in the latter part of that period. After 1100 A.D., the use of white paint on red pottery crossed to the Kayenta.

4. Certain traits are shared by both the Kayenta and Sinagua, 900–1100 A.D.: (a) earth lodge entered through a hole in the roof; (b) four post roof support—the Sinagua at one time had a two post roof support which diffused to them from the Hohokam and which did not diffuse to the Kayenta; (c) coiled and bundle basketry; (d) cotton textiles woven on a loom; (e) grooved metate; and (f) burial offerings.

The geographical frontier between the Sinagua and the Kayenta branches, archaeological surveys show, was a very real thing and ran northeast from the northern flanks of the San Francisco Peaks, following Deadmans Wash to the Little Colorado River, then southeast along the south side of the river valley to the neighborhood of Leupp. Thus, the contact line was about sixty miles long. Of course, the line was not a sharp one as the sites were more or less mixed in a strip about ten miles wide. This line, with minor variations, maintained its integrity for six hundred years, from about 700 A.D. to about 1300 A.D. when the country was finally abandoned by sedentary people.

Boundaries between branches often follow geographical barriers, waterless country, pine forests, or deep canyons, like the Grand Canyon, but this Kayenta-Sinagua boundary followed no definite barrier and

[8] Traits observed in traded objects and traits observed in objects whose source is questionable are not included in the summary.

for several hundred years after the eruption of Sunset Crater in 886 A.D. the area was relatively densely settled. Sites that occupied this frontier, such as Medicine Fort and Wupatki, furnish excellent material for the reconstruction of history.

A study of the distribution of the Sinagua branch shows that although the frontiers were relatively static on the north, the southeastern frontier was notably fluid. In the Verde Valley, before 1100 A.D., the Sinagua sites were confined to the foothills of the cliffs that bound the valley on its eastern side. The Hohokam occupied the area along the river. By 1150, the Sinagua had moved in to the river bottom, displacing the Hohokam and adopting irrigation. Between 1300 and 1400, the southern frontier had been pushed down the river past the Bloody Basin, perhaps as far as the Salt River Valley.

We can distinguish, then, two kinds of frontiers, static and fluid. We should be able to find reasons for this difference.

When we study the archaeology of the Hopi country, from the earliest manifestation, we find that it followed a definite evolutionary pattern until about 1300 when certain conservative attributes which had to do with religion and methods of manufacture changed. The D-shaped kiva gave way to the rectangular kiva with a platform, and the methods of firing pottery which had been unchanged for seven hundred years also were modified, through the use of an oxidizing atmosphere in the place of the reducing atmosphere. At the same time, many other traits, such as pottery design, were accepted from neighboring branches. From this we assume a break of some magnitude in the evolutionary sequence, a break which we will call a crisis. Starting at the present time, we can safely project back such important attributes as language, social organization, and religion, to 1300 A.D., but we cannot carry those attributes beyond 1300 A.D. because of this break in the evolutionary sequence. A crisis in the history of a branch may be due to war, conquest, or the migration of large groups of people. The changes are too sudden and too great to be explained by diffusion.

Another type of incident in the history of a branch is called by Kroeber a climax.[9] He defines a climax "As a point from which the greatest radiation of culture material has taken place in the area. But it is always necessary to remember that as a culture becomes richer, it also tends to become more highly organized, and in proportion as its organization grows, so does its capacity to assimilate and place new material, whether this be produced within or imported from without. In the long run high intensity cultures are the most absorptive as well as the most productive."

[9] Kroeber, 1939, p. 223.

Kroeber's definition of a climax does not stress the time element and, as it stands, applies particularly to living tribes, although he illustrates it with archaeological examples. The choice of the word "climax" for this phenomenon is unfortunate as it suggests the end of a process. Dominance would be a better word because a branch can be dominant in one time level and lose dominance in the next.

On the Kayenta-Sinagua frontier, we can see how a developing climax in the Kayenta can be measured by cultural traits and material objects crossing the frontier in trade. In other words a climax can be recognized by the direction and amount of diffusion.

The reconstruction of history in the Southwest depends primarily on the recognition of prehistoric Indian tribes called "branches" and the construction of a time scale. In north central Arizona, these basic conditions are now fulfilled; and the secondary factors of diffusion, persistence, frontiers, crises, and climaxes can be distinguished in many branches, such as the Sinagua.

We can recognize this branch from 700 A.D. to 1400 A.D. and can segment the branch on a time scale which includes the following eight foci or phases: Cinder Basin (?–700 A.D.),[10] Sunset (700–875 A.D.), Rio de Flag (875–1000 A.D.), Angell (1000–1100 A.D.), Padre (1050–1125 A.D.), Elden (1125–1200 A.D.), Turkey Hill (1200–1300 A.D.), and Clear Creek (1300–1400 A.D.). We can see how certain basic traits, particularly in pottery, persist through the seven hundred years. On the other hand, in its early history, traits diffused to the Sinagua from the Hohokam, which had a climax culture from before 900 A.D. to 1100 A.D.; and at a later date traits diffused from the Kayenta branch, which had a climax culture between 1150 and 1275 A.D. During the long history of the branch, major and minor crises occurred. The first crisis recognized, a minor one, largely local, was caused directly by the eruption of Sunset Crater. The second crisis, a major one, was a secondary effect of the eruption causing an influx of alien people, as is shown by the Winona excavations. A minor crisis evident in the Kayenta branch in the Tsegi area had little or no effect on the Sinagua in the early eleven hundreds. A major crisis occurred between 1276 and 1300 with the abandonment of the northern frontier and the movement south of the southern frontier at the expense of the Hohokam.

To reconstruct history, which is the main objective of archaeological study, the archaeologist must (1) recognize branches by archaeological surveys and excavation, (2) segment them by some system of chronology, determined by stratigraphy, or by some other method, (3) map them at contemporary periods and determine the geographic frontiers, (4)

[10] De Laguna, 1942, p. 53.

recognize persistence and diffusion by studying the attributes of each branch at a given time level, and (5) recognize crises and climaxes from a study of the relative amount and direction of diffusion. Repeating this study at every frontier or point of contact, the archaeologist can reconstruct the history of a people who left no written record.

With the above outline before us, we can see how much work needs to be done, where to work to get the information, and the kind of information to concentrate upon before a reasonably complete history of northern Arizona is possible. In the Flagstaff area, we have material for the study of the Kayenta-Sinagua, the Kayenta-Cohonina, the Sinagua-Cohonina, the Sinagua-Hohokam, the Sinagua-Salado, and the Kayenta-Mesa Verde frontiers; but the data on the Prescott branch, Cibola branch, Winslow branch and the Tusayan branch are incomplete; and until studies are made and published in all the foci of these branches a complete history of northern Arizona is not possible. To make these necessary studies is perfectly possible. We can look to the future to produce a history of northern Arizona and the whole Southwest more complete than that of any other area without a written record.

BIBLIOGRAPHY

COLTON, H. S.
1939. *Prehistoric Culture Units of Northern Arizona*. Museum of Northern Arizona, Bulletin 17. Flagstaff.

DE LAGUNA, FREDERICA
1942. "The Dig at Cinders Park." *Plateau*, Vol. 14, No. 4.

GIFFORD, W. S.
1936. *The Northeast Yavapai and Western Yavapai*. University of California Publications in American Archaeology and Ethnology, Vol. 34, No. 1.

GLADWIN, W., and H. S. GLADWIN
1934. *Method for the Designation of Cultures*. Medallion Papers. Globe, Arizona.

KROEBER, A. L.
1925. *Handbook of the Indians of California*. Bureau of American Ethnology, Bulletin 78. Washington.
1939. *Cultural and Natural Areas of Native North America*. University of California Publications in American Archaeology and Ethnology, Vol. 38.

ROUSE, IRVING
1939. *The Prehistory of Haiti, A Study in Method*. Yale University, Publications in Anthropology, No. 21.

Museum of Northern Arizona
Flagstaff, Arizona
October, 1941

ANCIENT GROOVED CLUBS AND MODERN RABBIT-STICKS

ROBERT F. HEIZER

THE problem of the functional identification of the distinctive grooved wooden clubs from the early archaeological horizons of the Southwest, and of their possible connection with the modern rabbit-sticks of certain Southwestern and southern Californian tribes has never been set forth in proper form. Similarity in form does not necessarily signify identity in function. Nowhere should this caution be followed more closely than in the allocation of use by the archaeologist to archaeological specimens. Thus, a disagreement on the identification of a highly specialized form of implement suggests that we may perhaps profitably inquire into the problems presented by the difference in opinion.

From archaeological sites in the southwestern states have come a great number of long, flattened, curved wooden "clubs" (Fig. 3) generally bearing a distinctive ornamentation in the form of three or four firmly incised parallel longitudinal grooves along the two flat surfaces. These four parallel grooves are often broken into "sets," apparently at the points where a sinew seizing, to prevent splitting, was wrapped around the club. At one end, a deeply incised groove has been commonly noted. This, presumably, served as a seat for the attachment of a cord or thong, perhaps in the form of a loop for the wrist. These wooden curved clubs generally are 17–25 inches in length, 1–2 inches in width, and $\frac{1}{4}$–$\frac{3}{4}$ inch in thickness. The shape of these flat clubs is either a simple curve or S-shaped; the latter is sometimes called recurved or double curved. My search of the literature has, due to library deficiencies, been only reasonably exhaustive. A great number of additional specimens must remain at large in the hands of private collectors, in undescribed museum collections, or are "awaiting publication." The characteristic features of various specimens described in the literature have been presented in Table I.[1] In discussing them, I shall attempt to analyze the variations exhibited by the specimens from different areas.

Guernsey and Kidder[2] in discussing the pieces recovered from White Dog Cave and Cave 6, in *Basket Maker Caves in Northeastern Arizona*, suggest that these clubs were not rabbit-sticks like those used by the modern Pueblos. The proposition is put forward that such clubs, since

[1] I wish to acknowledge my indebtedness to the following for their kindness in sending me the measurements of various specimens of grooved clubs and curved rabbit-sticks now in museum collections under their care: Mr. E. W. Gifford, Mr. Neil M. Judd, Dr. F. H. H. Roberts, Jr., Mr. E. B. Sayles, and Dr. A. V. Kidder.

[2] 1921, pp. 88–89.

they usually occur archaeologically with the atlatl or some adjunct of the atlatl, may be clubs held in the hand for warding off an opponent's atlatl darts. To support this contention, they call attention to a similar club held in the left hand of a warrior in an inscription on an altar in the Temple of the Tigers, who holds as well, an atlatl and a sheaf of spears. These authors offer, in further support, the information that,

> In the Peabody Museum are fragments of two grooved clubs from Yucatan which differ from ours [i.e., the Basketmaker specimens] only in that the broad surfaces and the edges are flat instead of being rounded, and that there are a greater number of grooves.[3]

Mrs. Nuttall, in her essay on the Mexican atlatl, shows a figure holding such a club in one hand and a spear-thrower in the other.[4] She notes[5] that a similar curved weapon is also known from a figure sculptured on the inner face of the left door post and by those on the columns of the Castillo de Chichen-Itza (Pl. II, Fig. 1, *b*). She remains undecided as to whether this represents an unusual form of atlatl or a sort of club.

Guernsey and Kidder, in summarizing their results, suggest that the grooved hand-club, as well as the atlatl, in Basketmaker culture, may point toward Mexico and be attributable to a southern derivation.[6] So far as I know, this suggestion has not promoted any particular controversy, either for or against, but at least one author has signified his doubt. R. M. Zingg, commenting upon Guernsey and Kidder's postulation of a connection farther south of Basketmaker culture on the basis of grooved, curved clubs and the atlatl, says:

> . . . the possibility must be kept in mind of the diffusion into the Southwest of a very old Middle American dart complex associating the atlatl, dart, and grooved club as a defensive weapon. But the present discontinuous distribution inclines the author [Zingg] to the view that this is a convergence in typology between the Maya dart element and a specialized form of the Southwest rabbit stick.
>
> Another factor contributes to this view, contrary to the diffusion thesis. The similarity in form of the Basket Maker II grooved sticks as found widely distributed in the archaeological horizon, contrast with a high variability in types of dart-throwers.[7]

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[3] Cf. the club in the left hand of the atlatl-equipped warrior shown in Plate II, Fig. 1,*b*.

[4] Nuttall, 1891, Pl. I, Fig. 1. Follett (1932) does not even mention these curved clubs, yet he must have been aware of their existence from the forms clearly shown on the monuments.

[5] *Ibid.*, p. 19, fn. 1. These figures are reproduced here (Pl. II, Fig. 2). For other illustrations see Maudsley's *Biologia Centralia Americana*, Vol. 3, Pls. 36, 38, 49; and Morris, Charlot and Morris, 1931, Pls. 41, 43, 45.

[6] By implication those students who have accepted Guernsey and Kidder's identification of these grooved clubs as fending-clubs also accept their postulation of a derivation from, or at least connection with, Yucatan. Morris (1939, p. 14) has lately emphasized his belief in these implements as fending-clubs, and calls attention to the Yucatan parallel.

[7] Zingg, 1935, pp. 42–43.

Zingg's view is open to some doubt. In the first place, throughout his work he uses the word Basketmaker most uncritically.[8] The factor of discontinuous distribution is hardly insurmountable, if we may judge from the almost indubitable evidence of cultural connection between the Maya and Gila (Hohokam) areas on the basis of ball courts.[9] As for

TABLE I

DESCRIPTIVE DATA ON CURVED, WOODEN CLUBS

	Caldwell Cave #1, Texas (Jackson, 1937)	Caldwell Cave #2, Texas (Jackson, 1937)	Brooks Cave, Texas (Jackson, 1937)	West Texas (Gladwin, 1937)	Near El Paso, Texas (Roberts, 1929)	Northeast of El Paso, Texas (Gould, 1929)	Carlsbad, New Mexico (Roberts, 1929)	Lava, New Mexico (Hough, 1914)	Southeast New Mexico (Mera, 1938)	Mimbres Valley (Kidder, n.d.)	Jemez Cave, New Mexico (Alexander, 1935)	Laguna Pit Shrine, N.M. (Parsons, 1918)	NE Arizona (Guernsey & Kidder, 1921)	Southern Utah (Judd, 1926)	Southeastern Nevada (Harrington, 1927)	Lovelock Cave, Nevada (Loud, 1929)
Number found	?	14	41		1	1	1	1	2	2		5	6	1	2
Fragmentary	+	+	+			+			+		+	+	1	2	+	
Complete		+	+	+	2		+	+		+			4	4		2
Form—simple arc or curve		+	+	+	1	+	+	+		+		+		2		
S-shape or recurved					1								+	2		2
Grooved—	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
Number of grooves	3	3	2–4*	4	4	3	4	4	4	4½	4	4	4	4		
Ungrooved (i.e. plain)		3	11†							1				2‖		2
No. of discontinuous "sets"		2	2–5	11	2‡		6						2	2		
Full length, unbroken grooves	?	+	23			+				+						
Length (in inches)		20	24		25		16½	25½		32			20½	24		19
Width	⅞–2½	1	1½		1½	1½		1½		1½	1		2	1		
Thickness	½–¾	½	¾		½		¾			½	¾		¾	¾		¾
Groove or notch at one end			+	+	+			+				+		+		
Assoc. with atlatl or adjunct			+		+			+	+	+	+	+	+			+
Assoc. with bow or adjunct	+	+	+		+	+								+		

* 3 grooves (19), 4 grooves (8), 2 grooves (2). † 5 sets (2), 4 sets (3), 3 sets (5), 2 sets (7).

‡ Another in 5 sets. Measurement given here is of top specimen illustrated by Roberts, 1929. Bottom specimen measures 25½×1½×¾ in. § Another with three grooves measures 20×¾×⅞ in.

‖ Two ungrooved specimens measure 21×1½×¾ in. and 22×1½×¾ in.

the variation in atlatl forms, they are, to judge from sites listed by Zingg, hardly comparable in time or content.[10] There seems to be a well

[8] For example, a fundamental of his entire hypothesis is assigning to Lovelock Cave the status of Basketmaker I (Hypothetical BM). Steward (1940), has corrected this error. [9] Haury, 1937. Other elements could be listed.

[10] Zingg obscures not only the whole atlatl question, but also the possible connection with curved flat clubs. For example, he lists the Ozark Bluff Dwellers in this regard; but there are no curved clubs known from this locality.

developed and characteristic atlatl form in the greater Southwest, and the grooved clubs have been found for the most part in association with this type of spear-thrower.[11] The statement made by Guernsey and Kidder[12] in 1921, that either atlatls or some adjunct of the atlatl had been found with all grooved clubs noted by them, could hardly be maintained today, since many grooved clubs have been found without association with other atlatls or darts, some even associated with the bow and arrow, and a few with both the atlatl and bow.

The chronological (temporal) relations of the early Texas cultures still remain somewhat problematical, though the work of F. M. Setzler for the U. S. National Museum, the investigation of the Gila Pueblo staff, and researches by various Texas institutions seem to indicate that the Pecos River, Big Bend, and Hueco Cave Dweller cultures are to be set somewhat apart from the Anasazi Basketmaker. The Texas Basketmaker-like cave cultures show a *general* culture-inventory resemblance to those of the Anasazi.

E. B. Sayles[13] lists the grooved throwing-stick as found in the same deposits with atlatls from the Pecos River Cave Dweller, Big Bend Cave Dweller, and Hueco Cave Dweller cultures. F. M. Setzler[14] lists the occurrence of grooved clubs and atlatls from southwestern Texas. F. H. H. Roberts, Jr.,[15] describes specimens from near El Paso, Texas (see Table I), and speculates that the four parallel grooved lines were broken at intervals so that a sinew wrapping could be put around the artifact to prevent breaking. The notch or groove at one end, Roberts thinks, was for attachment of a wrist thong. A possible use is suggested by this author, who thinks that these clubs would have made good offensive weapons at close quarters. On this we have, of course, no evidence, but it is possible that some such use might have been made of them. In view of their curved, flat form, I suggest as a further possibility that these clubs may have been used as throwing-sticks to be cast at an enemy at relatively close range. Most of the specimens Roberts discusses have, or show traces of, the pitch "bumpers" which are most clearly shown on the beautiful specimens from Heaton Cave.[16] The El Paso examples are of both types, the simple curve and the S-shaped or recurved form. They were found in association with atlatl darts.[17]

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[11] For list, see Fenenga and Wheat, 1940. [12] 1921, p. 89.

[13] 1935, Table 8. [14] 1935, p. 108. [15] 1929, pp. 11–13, Fig. 8.

[16] Judd, 1926, Pl. 51, *c*, *d*. F. H. H. Roberts, Jr., suggests in a letter that these may have served to prevent splintering or damage to the end when striking the ground. N. M. Judd suggests to me their possible function as a hand-grip.

[17] The cultural horizon in this peripheral (?) Texas area, shows Puebloan influences as well. Gould (1929) noted a similar situation.

Miss L. Gould describes, from a cave northeast of El Paso, a fragmentary grooved club.[18] It is in a simple arc form, and was found associated with arrowshafts.[19] The atlatl is not clearly in evidence, but a culture inventory including both characteristic Basketmaker and Pueblo forms was disclosed.

A. T. Jackson's report on certain Culberson County cave sites yields much information, though somewhat puzzling, on our grooved wooden clubs. From Caldwell Cave No. 1 came several fragments (Table I).[20] From Caldwell Cave No. 2 were gathered fourteen curved clubs bearing three, instead of the usual four, parallel, longitudinal grooves. From a third site, Brooks Cave, came the amazing number of forty-one specimens.[21] These, and the other Culberson County specimens, show a surprising variability in view of the relative similarity of other Southwestern specimens. In measurements, this large series is not abnormal; the variation comes in the number of parallel grooves (see Table I) which number two, three, and four. Two grooves are noted only from a single site, the Brooks Cave; three grooves have appeared only on Texas specimens;[22] four grooves are noted elsewhere in Texas, and are invariable on all other specimens from New Mexico, Arizona, and Utah. Atlatl fragments and arrowshafts were associated with the Brooks specimens,[23] and the Caldwell pieces occurred with arrowshafts.[24]

It is difficult to explain why so many of these curved flat clubs should be found in Texas caves. Jackson disavows their function as fending clubs, and calls them rabbit-sticks. He says,[25]

> Many specimens gave evidence of having been put to hard usage. Often one end was battered, as also occasionally were the sides. This seems to confirm their use as throwing or striking sticks.

I defer discussion on this point until later, saying only that Jackson makes a good point and seems to have evidence for his statement.

Gladwin[26] illustrates a curved club from "western Texas." It appears, from inspection of the photograph, to be an exceptionally long

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[18] 1929, pp. 156–157, Pl. B., Fig. 4.

[19] Setzler (1935, p. 108) significantly notes the additional presence of an atlatl bunt point. [20] Jackson, 1937, p. 161. [21] *Ibid.*, Pl. 32, Fig. 1, A-D.

[22] The three Culberson County sites, Shumla Caves (Martin, 1933), the cave seventy miles northeast of El Paso (Gould, 1929), and from a Val Verde County Shelter (Pearce and Jackson, 1933, pp. 44, 46).

[23] Jackson, 1937, pp. 185–191. Coffin (1932, pp. 22, 28, 61) notes grooved curved clubs associated with the atlatl and bow in Bee Cave, Brewster County, Texas.

[24] *Ibid.*, p. 162. [25] *Ibid.*, p. 182.

[26] 1937, Pl. XI. Technologically speaking the Hopi and Australian curved throwing-sticks are comparable. For general data on flat, curved throwing clubs, see Davidson, D. S., 1935, and 1936.

specimen, but bears the familiar four parallel grooves broken into eleven "sets," more than the Brooks Cave specimens which had at most five "sets."

A specimen from Carlsbad, New Mexico, mentioned by Judd[27] and Roberts,[28] but described by Gould,[29] is of the simple arc form, and originally had four grooves. It is noteworthy in being the thickest specimen on record. W. Hough figures and describes a splendid example of grooved club from near Luna, New Jexico.[30] It was found in association with a foreshafted atlatl dart point and two probable dart points. Hough implies that the curved club is an atlatl.[31] It is, however, as others who have discussed grooved clubs note, a typical specimen with the characteristic four parallel grooves.

H. P. Mera describes a fragmentary grooved club.[32] It has an unusual cord wrapping over the end; this is atypical, for most of the other specimens have a sinew or string wrapping a few centimeters from the rounded or obliquely cut end. This fragment was found in association with atlatl parts.[33] The excavation of Jemez Cave, New Mexico, yielded a fragment of what the authors of the report call a "grooved fending club."[34] They are in agreement with Guernsey and Kidder in separating it from the ethnographically known rabbit-stick. The fragment was found in connection with atlatl dart fragments and dates from Basketmaker times.[35] A questionable fragment of an ungrooved club from the same horizon is tentatively identified as a rabbit-stick; it is not curved.[36]

The excavation of the Laguna pit shrine, the contents of which was described by E. C. Parsons, yielded a number of grooved flat clubs, together with a series of atlatl dart fragments.[37] Guernsey and Kidder have quite plausibly explained the presence of these objects as deposited there by recent Pueblo Indians who, recovering them from Basketmaker Cave, regarded them with veneration.[38] Parsons implies that the curved, grooved clubs were formerly war clubs whose function has now changed to rabbit hunting instruments.[39]

The grooved clubs described by Guernsey and Kidder, and already

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[27] Judd, 1926, p. 147. [28] Roberts, 1929, p. 12.

[29] Gould, 1929, p. 157. [30] Hough, 1914, p. 19, Fig. 21.

[31] An atlatl butt is shown and tentatively identified as such by Hough, 1914, Pl. 20, Fig. 2, pp. 19, 96.

[32] Mera, 1938, pp. 58–59; Fig. 9; Pl. 11, Fig. 10. Mera mentions others as seen by him. [33] *Ibid.*, pp. 33–34. [34] Alexander and Reiter, 1935, p. 45, Fig. 10, Pl. 13.

[35] *Ibid.*, p. 65. [36] *Ibid.*, p. 46. [37] Parsons, 1918, p. 384, Figs. 36, 38, 39.

[38] Guernsey and Kidder, 1921, p. 89. There seems to be a possibility that the atlatl shown by Hough (1914, Pl. 20, Fig. 2), which was found in association with prayersticks ("roundels"), might be explained this way.

[39] This suggestion of the ancient function of these clubs is similar to that proposed by Roberts, 1929, p. 12.

mentioned in this paper, come from northeastern Arizona. Four complete examples and one fragmentary specimen have four parallel grooves in two "sets." These specimens, of S-shaped form, are somewhat wider at one end than most examples. They could hardly be called unusual, however, and are quite similar to Judd's Heaton Cave specimens.

From Heaton Cave, near Mount Trumbull in southern Utah, N. M. Judd has illustrated and described two complete and two fragmentary grooved clubs, and two plain clubs without grooving.[40] The two complete clubs are of the S-shape or recurved type. Four parallel longitudinal grooves are separated into two sets by a sinew wrapping, probably serving as strengthening and to prevent splitting.[41] I can think of no explanation for the pitch-covered "bumper" so clearly shown on the Heaton Cave specimens and noted for others (Table I). The ungrooved clubs do not show the painstaking care in manufacture that the others do, and Judd suggests their resemblance[42] to the Hopi rabbit-stick. The scoring at the end of one of the plain clubs leads me to suspect the former presence of a pitch-covered "bumper" which, in turn, would link them with the more finely made examples. The specimens were found in association with Basketmaker type sandals,[43] but the existence of Puebloan material may indicate transitional Basketmaker Pueblo.[44]

The Northern Periphery, although it bears much evidence of Southwestern traits has not yielded grooved clubs.[45]

From the well known Lovelock Cave, M. R. Harrington (describing new objects found in the 1924 excavations) notes "crooked clubs" and calls attention to their resemblance to certain Basketmaker specimens.[46] These clubs are of the S-shape or double-curved form, and in this respect do resemble the examples from southeastern Utah and northeastern Arizona. But they are more slender in form and have no longitudinal grooves. They are 19 inches long and $\frac{5}{8}$ inch thick (Table I) and are from the deeper, atlatl-bearing culture horizon.[47]

[40] 1926, pp. 147–148, Pl. 51.

[41] These sinew wrappings, found on nearly all specimens, were necessary because the bent hardwood staves would split easily unless bound thus. The binding and separation of grooves into "sets" seems referable to the necessities imposed by these bent hardwood, generally oak, staves. I surmise that, ordinarily, after the bend was produced the wrappings were applied, and, lastly, the grooves were incised. The explanation accounts for (1) the wrapping which separate (2) the "sets" of parallel lines. Variable numbers of parallel groove "sets" may reflect different woods or degrees of arc in the clubs. I do not have data at hand to test this theory.

[42] Not, however, so great judging from Gladwin's (1927, Pl. XI) illustration.

[43] Judd, 1926, Pl. 57*a*. [44] *Ibid.*, p. 148.

[45] Steward, 1933; and 1940, p. 470.

[46] Loud and Harrington, 1929, p. 111, Pl. 16*a*, *b*.

[47] Zingg (1935) believes the Lovelock Cave clubs were used as rabbit-sticks. This is consistent with his general view of the subject.

The problem of the relation of the early culture in Lovelock Cave has been most recently approached by Steward, who states[48] that "the early period culture is directly related to the Basketmaker in the subsistence complex and other features." He endorses Harrington's view[49] of approximate contemporaneity of the early Lovelock and Basketmaker culture.

From extreme southeastern Nevada in the so-called Western Peripheral area of the Pueblo culture, Harrington[50] mentions a fragment of a "typical Basketmaker carved club, and two or three fragments of atlatl spears" from the Salt Caves near Pueblo Grande de Nevada. This occurrence is of some interest to us in extending to the north and west the distribution of the grooved clubs.

The foregoing discussion has indicated that most, if not all, grooved clubs on record have come either from definite Basketmaker horizons or (in the cases of Texas and Nevada) from peripheral culture regions where there is strong Basketmaker influence. With a few exceptions, grooved clubs appear to be contemporaneous with the atlatl. A few recorded cases indicate the coexistence of the carefully made grooved wooden clubs and the bow and arrow, but in the later archaeological deposits in the same area these curved and grooved wooden clubs are, to my knowledge, definitely absent.[51] Thus, as the bow was introduced, it appears to have been used side by side with the atlatl, until the bow became dominant.[52] Grooved clubs may have lingered awhile in this period of transfer but, like the atlatl, they too were discontinued, at least in their classic form.

A. T. Jackson's monumental work on Texas petroglyphs yields several reasonably credible pictures (see Fig. 3, 4) of humans holding in one hand a curved club, and in the other a bow.[53] Several figures hold curved clubs in one hand with the other hand left free. In these cases, the curved club may be a throwing or striking weapon. When the figures hold the bow in one hand and a curved stick in the other, we may inquire as to whether the club was a defensive weapon for warding off an

[48] 1940, p. 464.

[49] Loud and Harrington, 1929, pp. 1–28, 119–123. The age estimate in the Lovelock Cave report must now be considered in the light of the dendrochronological placement of the southwestern Basketmaker horizons.

[50] 1927, p. 274.

[51] Guernsey (1931, Table, p. 117) lists the "throwing club" in the Pueblo III and IV column. These are differentiated from "grooved clubs" in the Basketmaker II column. I know of no further support for this allocation of throwing clubs to late Pueblo archaeological deposits.

[52] For data on the contemporaneous use of the bow and atlatl, see Setzler, 1935, p. 108; Loud and Harrington, 1929, pp. 25 and 122; Fenenga and Wheat, 1940; Cressman and Krieger, 1940, pp. 34, 47, and 49. See also Roberts, 1935, p. 10.

[53] Jackson, 1938, Pl. CCLXXIV, and pp. 392–393.

enemy's missiles. Or, after the arrow was discharged, could the curved club have been used to dispatch a wounded animal or enemy?[54] I suggest that the grooved club was used in the western Texas region as an important and specialized adjunct to hunting, first, with the atlatl, and, later, with the addition of the bow. Presumably, it was at this latter time that the pictographs shown by Jackson were inscribed.[55] An unusually extensive use of the curved grooved club is indicated by the large numbers recovered from west Texas archaeological deposits. Their useful nature, probably in hunting, is further attested by the scratches and scars as evidence of hard usage on the examples noted by Jackson.[56] It seems not unlikely that with the extensive use, and what we might call general proliferation of grooved clubs, came also variations in the form, specifically the decorative feature of the longitudinal parallel grooves. In evidence, Table I will show clearly that the west Texas series of clubs displays a high degree of variability in the secondary features of number of grooves and number of groove "sets," while the primary features of shape and size are closely comparable to those from the other localities. These Texas divergences may have taken their departure from a four-groove type, though if so this must have been early, since the numerical preponderance of all Texas examples bear three grooves. This point may prove of future significance when some student who has all the facts available can make an intensive study of the Texas material.

It has been suggested by several authors[57] that the old grooved clubs may have been rabbit-sticks, or that the ancient incised clubs were weapons of offense and degenerated in style while changing their function in modern times to become rabbit-clubs.[58] (See Fig. 3, 3.*e*

L. Spier lists the curved rabbit-stick as known ethnographically from the following groups: Hopi, Zuni, Navaho,[59] Mohave, Havasupai, Southern Diegueño, Luiseño, and Cahuilla.[60] Parsons is not completely clear, but seems to indicate the curved, plain club is used for rabbit-hunting at Laguna.[61] Kroeber[62] adds the Cupeño and Gabrieleño. Drucker corroborates[63] the above list and adds the Serrano. Gifford attests[64] the presence of the curved throwing club for the Warm Springs

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[54] Martin (1933, p. 31) proposes that the curved club may have been used to dispatch wounded enemies or animals, wounded by an atlatl dart, at close quarter. Cf. Stephen, 1936, pp. 99–100; Roberts, 1929.

[55] I have already mentioned the co-occurrence of the atlatl, bow and grooved club in the west Texas region. [56] 1937, p. 182. [57] Jackson, 1937; Zingg, 1935.

[58] Parsons, 1918, p. 384, fn. 2. [59] *Cf.* Hill, 1938, p. 170.

[60] Spier, 1928, p. 121. The Zuni also use straight billets of wood. The Yavapai, Pima, Western (?) Apache, Achomawi and Atsugewi use clubs of some sort for rabbit-hunting, but they are not the flat, curved variety. [61] Parsons, 1918, p. 384.

[62] 1925, Fig. 55, p. 632. The Costanoans (p. 467) use a straight club held in the hand in rabbit-drives. [63] 1937, p. 17; Notes, p. 48. [64] 1940, p. 33 (El. 1209–1212).

Apache, Huachuca Mts. Apache, Southern Ute, Walpi,[65] Zuni, Santa Ana and San Ildefonso. The curved rabbit-stick is also known from the Huerteño of Lower California.[66] Martinez in 1792 noted, among the

TABLE II

MEASUREMENTS OF MODERN CURVED RABBIT-STICKS

Measurements (in inches)	Tribes					
	Mohave (UCMA 1-1753)	Luiseño (UCMA 1-9215 A)	Luiseño (UCMA 1-9215 B)	Cupeño (UCMA 1-14493)	Diegueño (Peabody Mus.)	Huerteño (UCMA 3-3090)
Length (point to point across arc)	23	25	25½	24½	28	30
Length (outside arc)	31½	31½	30	27		33½
Width	1½	1½	1½	2	2	2
Thickness at center	½	½	½	½	½	½

Chumash, " . . . rabbit-sticks (planas), which they use with great skill in the hunting of rabbits and other animals.[67] Fr. Font, describing the natives of southern California said,

> They (the Jecuiches, now known as the Cahuilla) have another weapon, a sort of *macana*, which is made of hard wood, thin, about 3 inches wide, shaped like a crescent or sickle and about two-thirds of a vara (about 2 feet) long. With this stick they hunt hares and rabbits, throwing it in a certain way and breaking the animal's legs.[68]

Costanso, the engineer on the Portola expedition of 1769–1770 said of the Diegueño about San Diego Bay:[69]

> . . . they use a sort of throwing-stick (*macana*) of very hard wood, similar in form to a curved sabre which they throw edgewise, cutting the air with great force. They throw it farther than a stone, and never go into the surrounding country without it. When they see a snake or other noxious animal, they throw the throwing-stick at it, and generally cut the animal in two.

In Duhaut-Cilly's little known account of California in the years 1826–27, we find a lengthy and vivid description of the Point Loma rabbit hunt by the Indians of Mission San Diego.[70] Of the Indian hunters it is stated that:

> they are armed with *Macanas:* this is a curved and polished lath which they throw with great skill.

[65] See Stevenson, 1883, Figs. 548 and 549 for illustrations.

[66] UCMA specimen no. 3–3090. Other Lower California occurrences are attested by Clavigero, 1937, p. 100; Martinez, 1938, p. 17; Bolton, 1911, p. 78; and Krmptic, 1923, p. 126 (use for war and rabbit hunting, 28° Lat.).

[67] Martinez, 1938, p. 44. This passage may possibly refer to the Gabrieleño. The Chumash are not otherwise known to use this implement.

[68] Bolton, 1931, p. 131; photograph of Indian holding a club, Pl. opp. p. 126.

[69] Costanso, 1910, p. 31. [70] Duhaut-Cilly, 1929, p. 220.

Figures holding curved sticks. Fig. 1, above, *a*, modern Hopi Indian rabbit hunter (reproduced with permission of H. E. Bolton); *b*, Maya warrior with atlatl and curved club (after Nuttall). Fig. 2, below, Maya figures holding curved clubs (after Charnay).

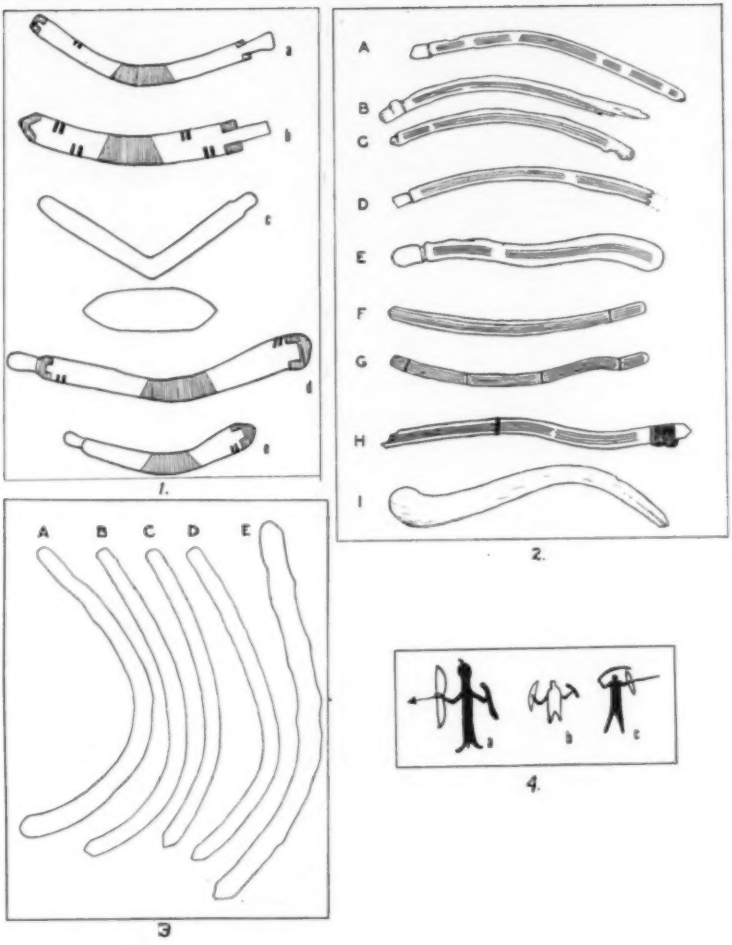

FIG. 3.—Curved Sticks. 1, modern curved rabbit-sticks: *a*, Hopi (after Gladwin); *b*, Hopi (after Stephen); *c*, Gabrieleño (after G. Davidson), below is cross-section two-fifths size; *d* and *e*, Walpi (after Stevenson). 2, ancient grooved and curved clubs: *a*, Lava, New Mexico (after Hough); *b* and *c*, west Texas (after Jackson); *d*, Laguna, New Mexico (after Parsons); *e*, northeastern Arizona (after Guernsey and Kidder); *f* and *g*, near El Paso, Texas (after Roberts); *h*, southern Utah (after Judd; Loud and Harrington). 3, modern curved rabbit-sticks (courtesy University of California Museum of Anthropology): *a*, Mohave (UCMA 1–1753); *b*, Luiseño, near Valley Center (UCMA 1–9215 A); *c*, Cupeño (UCMA 1–14493); *d*, Luiseño (UCMA 1–9215 B); *e*, Huerteño, Lower California (UCMA 3–3090). 4, west Texas pictographs showing men with bows and curved clubs (after Jackson).

According to Fages:[71]

> They (the Gabrieleño Indians) make . . . a kind of war club of tough wood in the shape of a well balanced cutlass, which they use in war and in hunting conies, hares, deer, coyotes and antelope, throwing it so far and with such certain aim, that they rarely fail to break the bones of such of these animals as come within range.

Southern California rabbit-sticks are shown by Kroeber[72] (Luiseño, Cupeño, and Mohave), and G. Davidson[73] (Gabrieleño?) who states the specimen (see Fig. 3, 1*c*) is from Santiago Canyon, twenty-four miles from Anaheim. It could be thrown, skimming the surface of the ground, for more than one hundred yards, then rising fifty to sixty feet in the air. It could not be made to return, and Davidson says he "in fact had never supposed it possible." It was made of hard wood, and weighed fifteen ounces; the elbow was formed by a natural bend in the wood. It measured 30 inches long,[74] 2 inches wide and was ½ inch thick.

The modern Hopi rabbit-stick illustrated by Bolton[75] and Gladwin[76] is a simple curved flat stick with a handle cut out (see Fig. 3, 1*a*) like that figured by Davidson from the Gabrieleño (cf. Fig. 3, 1*a*, *b*, *c*). The Hopi seem to have used the curved club both for rabbit hunting and for war. A. M. Stephen in his *Hopi Journal*, states that the club could:

> . . . be thrown so as readily to break an arm or leg or kill if it strike an enemy in the forehead. But it is most efficient to be thrown at an enemy drawing his bow or aiming; it is hurled so as to strike the bow, and the Hopi rush in and spear the enemy before he can recover.[77]

The use of the curved throwing-stick in war is further attested by Gifford who lists this practice for Southern Ute and Walpi.[78]

RELATION OF THE ANCIENT GROOVED CLUBS AND MODERN RABBIT-STICKS

In this final section we approach the problem which seemed to justify the study of these two temporally discontinuous groups of objects.

We have traced in some detail the old grooved clubs from Basketmaker and related archaeological horizons. The relative uniformity of

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[71] 1937, p. 22; 1884, p. 379. Bancroft (1886, p. 379) translates this passage as describing "a sabre edged with sharp flints." There is no mention of this feature, found in Mexico in the obsidian-edged hand sword. Bancroft's translation is in error.

[72] 1925, Fig. 55. [73] 1874, p. 233.

[74] Guernsey and Kidder (1921, p. 89) note an ungrooved, plain curved club about 26 inches long collected from the Diegueño by E. Palmer in 1875, and now in the Peabody Museum.

[75] Bolton (1931, Pl. opp. p. 126). Reproduced here in Plate II, Fig. 1, *a*, with the kind permission of Dr. Bolton. Hopi identification from *National Geographic Magazine*, Vol. 60, No. 1, p. 22, 1929. [76] 1937, Pl. XI.

[77] Stephen, 1936, Part I, p. 99. [78] Gifford, 1940, p. 123 (El. 1209–1213).

types makes it clear that the curved clubs had a common historical background. We have, in attempting to assign a function to these archaeological objects, suggested a number of possible uses. These include: (1) clubs held in the hand to fend or ward off the atlatl darts or arrows of an enemy; (2) throwing clubs to be hurled at an enemy to disturb his aim or to injure him; (3) striking clubs to deliver crushing or cutting blows (with the rounded edge) at an enemy or wounded animal at close quarters; and (4) throwing- or skimming-clubs, comparable to modern examples, for rabbit-hunting.

The modern curved club differs from the archaeological forms in the following characters: (1) absence of S-shape or recurved form; (2) absence of longitudinal, parallel grooves; (3) presence of a carved handle instead of a groove for attachment of a wrist-thong; and (4) absence of pitch-covered "bumpers" (use unknown) at one end. These seem to me to be really non-essential or secondary features.

The ancient and modern types resemble each other (1) in length, breadth, and thickness (cf. Table I and II), and (2) in their flat, simple-arc shape. These would appear to be essential or primary features.

Working on the possibility that these two, modern and ancient, forms are genetically connected, what indications support the theory? We have noted the archaeological co-occurrence of plain, ungrooved clubs with grooved clubs.[79] It is logically possible that originally the grooved club was an integral part of the atlatl complex, but when the bow was introduced, and supplanted the atlatl, the grooved club lost its old functional association and took on a new function—that of a striking or throwing weapon mainly for hunting. A possible survival of its earlier war function has been noted among the Southern Ute, Walpi, Hopi and Gabrieleño. As supporting evidence of such an evolutionary process, note how the original grooved club lost its end transverse groove (to which a thong might be attached so that the club could dangle from the wrist and enable the warrior to fit the dart butt in the atlatl spur) and adopted a cut hand-grip to give a firm grasp to the hunter when he cast the weapon at an animal.[80] The longitudinal multiple grooves are understandable as being originally a part of any correctly made club.

[79] See Table I (Caldwell Cave No. 2, Brooks Cave, Jemez Cave, Heaton Cave), Lovelock Cave stands alone in having *only* plain curved clubs from a Basketmakerlike horizon. The carved clubs may have lost their grooving on the way as they diffused into Nevada. Or, if these plain Lovelock Cave clubs are related to the Basketmaker type (cf. the parallel in S-shape) they may derive from a late BM (BM III?) form of ungrooved club such as those noted by Judd in Heaton Cave. This is a possible clue as to the time of derivation of BM elements found in Lovelock Cave.

[80] Some of the Texas specimens, suggested already as in the transition stage, have cut hand-grips (Jackson, 1937, Pl. 32).

They had, in other words, some psychological connotation; this view is supported by their constancy in most specimens over a wide area. As these grooved clubs lost their association with the atlatl, and a new people who had a new weapon (the bow) became dominant,[81] the grooves meant less and less, but the general form proved useful and became reapplied as part of a special hunting technique for rabbits.[82] In the Southwest proper these curved clubs underwent other modifications.[83]

It does not seem possible to trace the curved club through the archaeological continuum of Pueblo prehistory, but there is little doubt that the earliest Puebloans knew of the early form of club,[84] and furthermore, that numerous Southwestern ethnic groups knew the club aboriginally. If this temporal gap could be bridged, we might be on more certain ground for suggesting what now seems only a probability, viz., that the modern curved rabbit-sticks are historically connected with the ancient Basketmaker grooved clubs.[85]

BIBLIOGRAPHY

ALEXANDER, H. G., and P. REITER
1935. *Report on the Excavation of Jemez Cave, New Mexico.* University of New Mexico Bulletin, Monograph Series, Vol. 1, No. 3, Whole No. 278.

BANCROFT, H. H.
1886. *The Native Races of the Pacific States. Vol. I, Wild Tribes.* San Francisco.

BOLTON, H. E.
1911. *Spanish Exploration in the Southwest.* New York.
1931. *Font's Complete Diary.* Berkeley.

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[81] This brings up the question of the relative efficiency of the atlatl and bow. A long, heavy dart, thrown with an atlatl is probably less accurate than an arrow shot from a bow. An animal might therefore more often be merely wounded with the atlatl and necessitate dispatching with a club. In itself, this, if it is true, would give sufficient reason for the association of the club and atlatl. The use of the club as a fending weapon is similarly logical—a man could easily deflect a long, heavy atlatl dart which he could see coming from a long distance away. I forego this tempting sort of speculation, but it may be worthwhile to consider it sometime at length. For data on the use, accuracy, and range of the atlatl see Pitt-Rivers, 1906, p. 133.

[82] The presence of the plain, ungrooved club in peripheral areas or in late Basketmaker III times along with the grooved club may indicate the beginning of the abandonment of the club in classic form with its older set of associations.

[83] See Fig. 3, 1 for illustrations of painted rabbit-sticks. This implement has, as one might expect, entered into the ceremonial life of the Hopi (Stephen, 1936) and has gathered unto itself an origin myth (Stephen, 1936, p. 100) which explains also the symbolism of the painted designs. Southern California rabbit-sticks are simple utilitarian tools and seem to have not developed these additional elements which distinctively characterize those of the Pueblo peoples.

[84] At least in late Basketmaker III times; perhaps in early Pueblo I times.

[85] This conclusion supports E. C. Parsons' (1918) proposal.

COFFIN, E. F.
1932. *Archaeological Exploration of a Rock Shelter in Brewster County, Texas.* Museum of the American Indian, Heye Foundation, Indian Notes and Monographs, No. 48.

COSTANSO, M.
1910. *The Narrative of the Portola Expedition, 1769–1770.* Publications of the Academy of Pacific Coast History Vol. I, No. 4.

CHARNAY, D.
1887. *The Ancient Cities of the New World.* New York.

CLAVIGERO
1937. *The History of [Lower] California.* Translated By Lake and Gray, Stanford University Press.

CRESSMAN, L. S., and A. D. KRIEGER
1940. "Atlatls and Associated Artifacts from Southcentral Oregon." In *Early Man in Oregon.* University of Oregon Monographs, Studies in Anthropology, No. 3, pp. 16–53.

DAVIDSON, G.
1873. "Remarks on a Boomerang from Los Angeles County, California." *Proceedings, California Academy of Sciences,* Vol. 4, p. 233.

DAVIDSON, D. S.
1935. "Is the Boomerang Oriental?" *Journal of the American Oriental Society,* Vol. 55.
1936. "Australian Throwing-Sticks, Throwing-Clubs, and Boomerangs." *American Anthropologist,* Vol. 38, pp. 76–100.

DRUCKER, P.
1937. *Culture Element Distributions: V. Southern California.* University of California Anthropological Records, Vol. 1.

DUHAUT-CILLY, A.
1929. "Duhaut-Cilly's Account of California in the Years 1827–28." *California Historical Quarterly,* Vol. 8, pp. 130–166, 214–250, 306–336. Translated by C. F. Carter.

FAGES, P. A.
1937. *A Historical, Political and Natural Description of California by Pedro Fages.* Berkeley. Translated by H. I. Priestley.

FENENGA, F., and J. B. WHEAT
1940. "An Atlatl from the Baylor Rock Shelter, Culberson County, Texas." AMERICAN ANTIQUITY, Vol. 3, pp. 221–223.

FOLLETT, P. H. F.
1932. "War and Weapons of the Maya." Tulane University Middle American Research Series, No. 4, pp. 375–410.

GIFFORD, E. W.
1940. *Culture Element Distributions: XII. Apache-Pueblo.* University of California Anthropological Records, Vol. 4, No. 1.

GLADWIN, H. S.
1937. *Excavations at Snaketown II.* Medallion Papers, No. 26. Globe, Arizona.

GOULD, L.
1929. "A Grooved Club and Other Artifacts from a Cave Seventy Miles Northeast of El Paso, Texas." *Proceedings of the Oklahoma Academy of Science, n.s.* Vol. 9, pp. 155–159. University of Oklahoma Bulletin No. 456. Norman.

GUERNSEY, S. J.
1931. *Explorations in Northeastern Arizona.* Papers of the Peabody Museum of American Archaeology and Ethnology, Harvard University, Vol. 12, No. 1. Cambridge.

GUERNSEY, S. J., and A. V. KIDDER
1921. *Basket-Maker Caves of Northeastern Arizona.* Papers of the Peabody Museum of American Archaeology and Ethnology, Harvard University, Vol. 8, No. 2. Cambridge.

HARRINGTON, M. R.
1927. "A Primitive Pueblo City in Nevada." *American Anthropologist,* Vol. 29, pp. 262–277.

HAURY, E. W.
1927. "Ball Courts." In *Excavations at Snaketown.* Medallion Papers, No. 25, pp. 36–49. Globe, Arizona.

HILL, W. W.
1938. *The Agricultural and Hunting Methods of the Navajo Indians.* Yale University, Publications in Anthropology, No. 18.

HOUGH, W.
1914. *Culture of the Ancient Pueblos of the Upper Gila Region, New Mexico and Arizona.* United States National Museum, Bulletin 87.

JACKSON, A. T.
1937. "Exploration of Certain Sites in Culberson County, Texas." *Bulletin of the Texas Archeological and Paleontological Society,* Vol. 9, pp. 146–192. Abilene.
1938. *Picture-Writing of Texas Indians.* University of Texas Publications, Anthropological Papers Vol. 2. Bureau of Research in the Social Sciences, Study No. 27. Austin.

JUDD, N. M.
1926. *Archaeological Observations North of the Rio Colorado.* Bureau of American Ethnology, Bulletin 82. Washington.

KRMPTIC, M. D.
1923. *The Life and Works of the Rev. Ferdinand Konščak, S. J.* Boston.

KROEBER, A. L.
1925. *Handbook of the Indians of California.* Bureau of American Ethnology, Bulletin 78. Washington.

LOUD, L. L., and M. R. HARRINGTON
1929. *Lovelock Cave.* University of California Publications in American Archaeology and Ethnology, Vol. 25, pp. 1–183.

MARTIN, G. C.
1933. *Archaeological Exploration of Shumla Caves.* Big Bend Basket Maker Papers No. 3, Southwest Texas Archaeological Society, Witte Memorial Museum, San Antonio, Texas.

MARTINEZ, J. L.
1938. *California in 1792. The Expedition of Jose Longinos Martinez.* Translated by L. B. Simpson. San Marino, California.

MERA, H. P.
1938. *Reconnaissance and Excavation in Southeastern New Mexico.* American Anthropological Association, Memoir 51.

MORRIS, E. H.
1939. *Archaeological Studies in the La Plata District.* Carnegie Institution of Washington, Publication 519. Washington.

MORRIS, E., J. CHARLOT, and A. A. MORRIS
1931. *The Temple of the Warriors at Chichen-Itza, Yucatan.* Carnegie Institution of Washington, Publication 406. Washington.

NUTTALL, Z.
1891. *The Atlatl or Spear-thrower of the Ancient Mexicans.* Archaeological and Ethnological Papers of the Peabody Museum, Vol. 1, No. 3.

PARSONS, E. C.
1918. "War God Shrines of Laguna and Zuni." *American Anthropologist,* Vol. 20, pp. 381–405.

PEARCE, J. E., and A. T. JACKSON
1933. *A Prehistoric Rock Shelter in Val Verde County, Texas.* University of Texas Bulletin 3327. Anthropological Papers, Vol. 1, No. 3.

PITT-RIVERS, A. L. F.
1906. *The Evolution of Culture and other Essays.* Oxford.

ROBERTS, F. H. H., JR.
1929. *Recent Archaeological Developments in the Vicinity of El Paso, Texas.* Smithsonian Miscellaneous Collections, Vol. 81, No. 7. Washington.

SAYLES, E. B.
1935. *An Archaeological Survey of Texas.* Medallion Papers, Vol. 17, Globe, Arizona.

SETZLER, F. M.
1935. "A Prehistoric Cave Culture in Southwestern Texas." *American Anthropologist,* Vol. 37, pp. 104–110.

SPIER, L.
1928. *Havasupai Ethnography.* American Museum of Natural History, Anthropological Papers, Vol. 24, Part 3.

STEPHEN, A. M.
1936. *Hopi Journal of A. M. Stephen. Parts I-II.* Columbia University Press. Edited by E. C. Parsons.

STEVENSON, J.
1883. *Illustrated Catalogue of the Collections Obtained from the Indians of New Mexico and Arizona in 1879.* Bureau of American Ethnology, 2nd Annual Report, pp. 319–422. Washington.

STEWARD, J. H.
1933. *Archaeological Problems of the Northern Periphery of the Southwest.* Museum of Northern Arizona, Bulletin 5. Flagstaff.
1940. "Native Cultures of the Intermontane (Great Basin) Area." In *Essays in Historical Anthropology of North America.* Smithsonian Miscellaneous Collections, Vol. 100, pp. 445–502. Washington.

ZINGG, R. M.
1937. *A Reconstruction of Uto-Aztekan History.* University of Chicago.

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January, 1941

A PUEBLO CAVE SITE AT TRES PIEDRAS, NEW MEXICO

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KIRK BRYAN and A. P. Butler, Jr., reported finding, in 1938, artifacts of glassy andesite on the northwestern part of the Taos Plateau in New Mexico. They concluded: "non-Pueblo peoples having Great Plains affinities appear to have used the material."[1] Knowing that we were to be in New Mexico, Bryan suggested that we investigate a small cave at Tres Piedras where, in 1940, he had found flakes of the andesite in association with coal. The week of July 7, 1941, was spent at the site.

Tres Piedras is located in the extreme north central part of New Mexico, about twenty-five miles south of the Colorado state line. The site is about two miles south of the town on land owned by Mr. Claire Hawkins, who very kindly gave us permission to excavate.

The cave is about ten feet higher than a nearby Coast and Geodetic Survey bench mark, elevation 8036.089 feet. It consists of a rectangular shelter or niche at the southwest corner of an isolated granitic outcrop with an overhang of about three by five meters. A ground plan is given in Fig. 4. The ceiling is about 130 cm above the present floor of dung. A large fragment of the outcrop is partly buried in the southwest corner. From this, at some time, a low rock wall was built, shutting off the west side.

A trench, one meter wide, was dug from the rocks just in front of the entrance to the back wall, and a small test was made between some rocks near the southwest corner. The excavated areas are shown on the plan, Fig. 4. The debris was removed in arbitrary ten-centimeter levels, profiles were taken on both side walls, and cross-sections at each meter. A brief surface survey was also made. The east profile of the trench is shown in Fig. 4. The abbreviated stake numbers are those of the southeast corner of each square and serve to identify the one-meter square to the north and west of the stake.

The top layer consisted of trampled animal dung about 10 cm thick. It contained a few chips of andesite, obsidian, and quartz, nails, glass, coal, and one sherd of Indian pottery. Below it was the layer of Indian occupation. Under this occupation layer was sterile red sand containing pebbles and, occasionally, medium sized rocks. This red subsoil continued to the rear wall of the cave except where a pit had penetrated to a rock floor. The portion of this pit in the trench is shown by dashed

[1] Bryan and Butler, 1940.

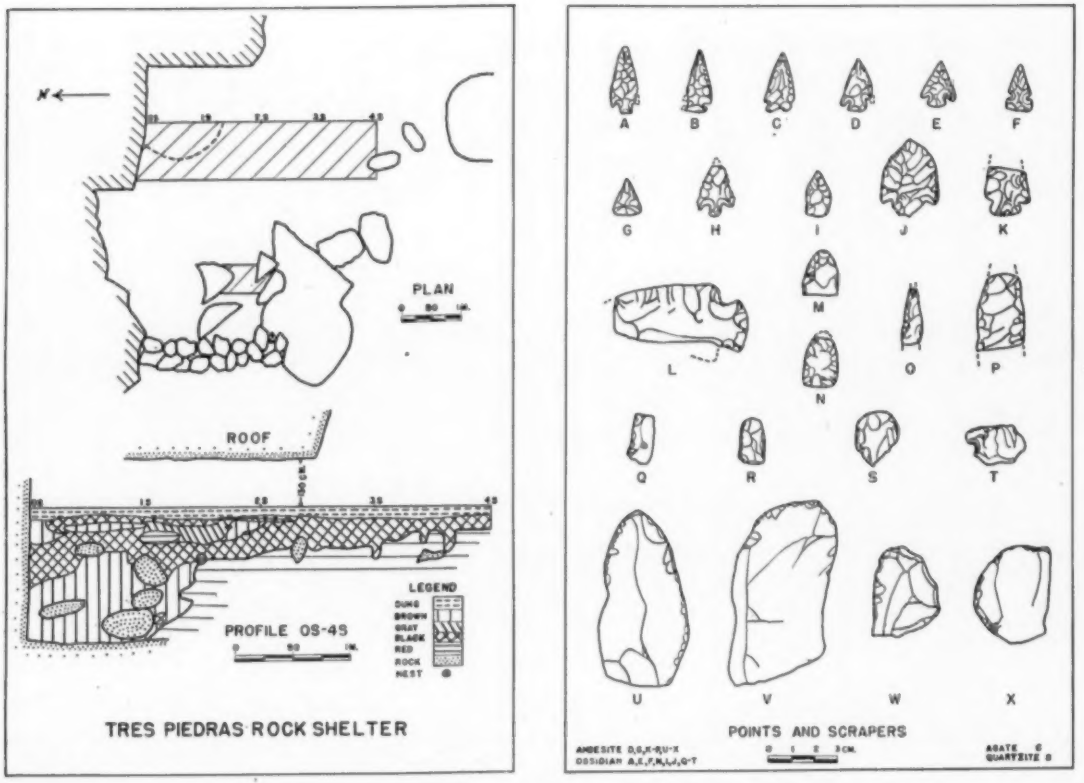

FIG. 4.—Plan, cross-section, and artifacts, Tres Piedras, New Mexico.

lines on the ground plan, Fig. 4. The black portion of the deposit seemed to consist of the subsoil or sand well mixed with charcoal and refuse. The brown portion was similar in composition and the color difference accounted for by the relative percentage of charcoal. The red lenses represented the subsoil unmixed with charcoal or other material.

Examination of the east profile (Fig. 4) will indicate that a homogeneous black deposit was found from Stake 4S almost to Stake 2S where it was split by a brown layer. To the rear of the cave a confusing array of different colored lenses was met. This seemed to be the result of disturbance for which three causes were found. Midway in the west wall of Square 2S a small hole had recently been dug, presumedly the test hole dug by Bryan in 1940. As shown on the profile (Fig. 4), an animal's nest was found in the east wall of Square 2S, 45 cm below the surface. Burrows from this nest went in two directions through the rear squares between the 20 and 40 cm levels. However, the major part of the disturbance seemed to be the result of the digging of the large pit mentioned earlier.

This pit had been dug into the red subsoil down to the rock floor of the cave which it met at a depth of 115 cm. It was filled with brown sand containing occasional rocks and circular deposits of charcoal as well as a few chips of andesite and fragments of burnt bone. The deposit here was so damp that water could be wrung from it, precluding any expectation of finding perishable material. There was a suggestion that the pit might have been lined with stones but the small amount excavated was insufficient to settle that point. By the south edge of the pit, at a depth of 60 cm, was a rock that might have served as a metate. Touching the back or north wall of the cave, at a depth of 50 cm, was a mano. These seemed to be the only artifacts associated with the pit.

Two or three postholes, found about half way through Square 4S, were in front of the overhang and seemed to form a line paralleling the entrance, but excavations were not carried to each side to see if a brush wall would be indicated.

The important point in determining the users of the andesite is the question of the association in the ground of andesite and pottery. Andesite, either in the form of artifacts or chips, was found in all levels of all squares. Pottery was found between the depths of 12 and 35 cm in Square 3S; 20 and 50 cm in Square 2S; and 16 and 55 cm in Square 1S. The association was complete.

Obsidian followed the same distribution as the andesite. Broken burnt animal bones and fragments of unburnt coal were found in Squares 2S and 1S but not in the others. In Square 1S this unburnt coal was found at a depth of 35 cm and between 50 and 60 cm. Only three of the

FIG. 4.—Plan, cross-section, and artifacts, Tres Piedras, New Mexico.

projectile points seemed typologically unique for the trench. They were (1) a heavy wide obsidian point with extremely excurvate sides (*j* in Fig. 4) at a depth of 35 cm, (2) a slightly serrated point (*h* in Fig. 4) at a depth of over 50 cm, both in Square 2S, and (3) an obsidian point with side notches (*f* in Fig. 4) at a depth of 25 cm in Square 1S. The mano and possible metate have been mentioned earlier.

The test among the rocks near the southwest corner of the cave indicated a black layer under the dung, 20 cm thick. In it were found andesite and obsidian chips and broken points including the two larger andesite ones illustrated as *k* and *l* in Fig. 4. Fragments that might have come from the middle portion of either of these were found in the main trench, *p* in Fig. 4.

It seems from the above that we have here evidence of the use of this cave by one group of people and that, as far as this site goes, the users of the andesite were also the users of the pottery.

The mano was of the type usually referred to as "one hand" or circular. It was 8½ cm across and about 4 cm thick. It was made of basalt and for slightly over half of its perimeter had been pecked circularly, while the rest of the sides were unworked. The top was also unworked, but the bottom had been ground to a smooth, slightly convex, surface.

A fragment of a granitic rock, about 2¾ cm long, and semi-oval in cross-section, was found. The top of the curved surface had been pecked longitudinally as though it had been used as a hammerstone.

All the types of points, knives, and scrapers found are illustrated in Fig. 4, and so will be only briefly referred to. Eight points were slender trianguloids, (*a*, *b*, or *c*). Ten points are represented by *d* to *i* but five of them were like *d* and *e*. The large fragments of andesite points or knives (*k* and *l*) were found in the test near the southwest corner of the cave. *l* is similar to the one illustrated by Bryan and Butler.[2] Four fragments similar to *p*, all from the main trench, could well be parts of such implements. *m* and *n* seem to be blunt points or knives and *o* a drill or perforator. Scrapers, *q*–*t*, were of obsidian and *u*–*x*, all of andesite, might be called knives or utilized flakes: all have been retouched along parts of their edges. The latter are similar to those illustrated by Bryan and Butler.[3] There were also some obsidian and andesite flakes which showed use but no retouching or evidence of intentional manufacture.

One small andesite chip, 1½ by 1½ cm, had three notches made in one edge. A small pink stone, 2×1×.8 cm, may have been used for paint. It rubs easily on paper. None of the coal had been worked.

No bone artifacts were found and the animal bones were too frag-

[2] *Ibid.*, B in Fig. 2. [3] *Ibid.*, C, D, and E in Fig. 2.

mentary for much identification but mule deer, antelope, and cottontail rabbit were represented.

A total of ninety-four sherds were found of which only four pairs could be fitted together. The color range was from dark gray (Fuscous)[4] to tan (Cinnamon-Brown, Avellaneous, and Fawn Color were represented). Their thickness varied from .7 to .4 cm. They seemed to fall into different groups as described below.

The majority, sixty-two sherds, were gray on the surface and very dark gray, almost black (Dusky Purplish Gray) in mid-section. The temper was fine oval quartz, the largest observed being 3×2×1 mm, but almost all were well under 1 mm. There was a small amount of micaceous material present. Seven additional sherds probably belong in this group as they differed only in being tan. The external surface had been crudely smoothed, apparently by the hand. It contained numerous cracks, pits, and irregularities. The inside was smoother than the outside and may have received a thin wash. A bottom sherd indicated a concave base 6 cm in diameter with a .5 cm concavity. Three rim sherds showed a plain, slightly everted rim with the inside pinched, resulting in a lip about half as thick as the wall. A fourth rim sherd was similar but flared out 1 cm from a point about 1½ cm from the lip.

The second group of sherds had thicker walls, more and coarser temper in which there was more micaceous material, and rougher interiors. Temper showed abundantly on the surface and frequently was 2 mm in length. Of the ten sherds in this group, five were fragments of vessel bases.

A third group of seven sherds was decorated on the outside with corrugations that had been partly rubbed out. Temper was very large and extremely high in percentage. Quartz and other pebbles as large as 4 mm were measured. There seemed to be no micaceous material present. With the exception of one sherd, the inner surfaces have apparently disappeared. The temper sticks out on both the external and internal surfaces.

The fourth group consisted of five sherds similar to the first group in composition but with less temper and less micaceous material. They were tanner or pinker in color and the surface had been well smoothed. They seemed to be neck sherds and were decorated by incising, apparently consisting of two parallel lines above a herringbone design which had more lines sloping to the right than to the left. The incising was 2½ mm wide.

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[4] All color references are from Robert Ridgeway's *Color Standards and Color Nomenclature.*

One rim sherd, not described above, may have been a fragment of a pipe. It was in poor condition.

The corrugated ware seems to be Tesuque Smeared-indented. The dark gray ware of the first group looks exactly like that which Mera illustrates as accompanying Sante Fé Black-on-white and Tesuque Smeared-indented.[5] The incised ware is identical with the illustration which Mera gives for a utility ware accompanying his Chaco 2 decorated wares.[6]

The pottery from the Tres Piedras cave seems to represent utility wares typical of the Rio Grande pueblos. It represents the first pottery reported from this area and so extends the area for which these Rio Grande wares are known further north, and to the west bank of that river. That such pottery should be found in this area is logical, as Tres Piedras is only about thirty miles northwest of Taos. The nearest known prehistoric pueblos probably are those at Ojo Caliente only twenty-five miles to the south.

Mera places the incised ware like that of Tres Piedras as of Pueblo II times. The Tesuque Smeared-indented he calls Pueblo III, while the gray ware is associated at the Rio Grande pueblos with Sante Fé Black-on-white which is also classed as Pueblo III. In his diagram, however, he gives Sante Fé Black-on-white as both Pueblo II and Pueblo III.[7] That this is true would seem to be the implication at the Tres Piedras cave as the gray ware was found lower in the undisturbed squares, 4S and 3S. The Tesuque Smeared-indented seems to be of the early type due to the coarse temper and lack of micaceous material.[8] In any event, use of the cave in Pueblo II and Pueblo III times is apparent. It may also have been used earlier and later.

That Tres Piedras does not represent the most northern extension of puebloan pottery is indicated by the work of Renaud in southern and southeastern Colorado. He reports some corrugated pottery from the Arkansas River.[9] Judging from the illustration, it had smoothed over corrugations. He also mentions seven sites in the San Luis-Rio Grande region of Colorado with painted pottery.[10]

During the summer of 1941, Mr. and Mrs. Paul Gebhart surveyed a considerable portion of Yuma County, Colorado. While the pottery at certain sites was cordmarked or punctated, at others the plain ware was fairly similar to the gray of Tres Piedras, and at one site a few sherds with rubbed over corrugations were found.[11] There seemed to be a vague

[5] Mera, 1935, Pl. VIII, bottom sherds.
[6] *Ibid.*, Pl. II, sherd in lower left hand corner.
[7] *Ibid.*, appended diagram.
[8] *Ibid.*, p. 14.
[9] Renaud, 1931.
[10] Renaud, 1935.
[11] Mr. and Mrs. Gebhart very kindly allowed the authors to examine their material.

association in that the more nearly the pottery resembled that from Tres Piedras, the more often similar small points and scrapers were found. They also found some of the blunt-ended points which may have diagnostic possibilities.

While the stone artifacts from Tres Piedras are common to both the Plains and the Pueblo areas, they are more typical of those from the latter.[12] The blunt points and small scrapers may have northern affinities but there is not much evidence one way or the other. The mano, while considered a Plains type, and common in eastern Colorado,[13] is also fairly common in the Rio Grande pueblos. Several were found at Pecos.[14] Even the fragments of possible spear points seem just like those from Basketmaker sites.[15] The large knives, scrapers, or skinners have definite Plains leanings, but this may be fortuitous. They are too amorphous to be diagnostic.

Further investigation around Tres Piedras and to the north and east would seem to be worthwhile. The authors surveyed two other outcrops at Tres Piedras and found, abundantly, flakes of andesite and obsidian, as well as a few points. The latter were very different typologically from those found in the cave. Mr. Rush has a collection from his farm, just northeast of Tres Piedras, which also indicates a different culture. Larger points are included, together with drills and knives. The latter have been made as such and are not merely utilized flakes. The Rushes feel that there was a village on their land as they saw tipi rings when plowing. The material in their collection and from the surface survey, in the main, seems to suggest Plains Indians. The opportunity for further investigation of Pueblo and Plains relationships is present here.

Renaud reports[16] artifacts of "black quartzite" on the Rio Grande forty-five miles north of Tres Piedras. Probably this material is glassy andesite. Also near Cone on the east bank of the Rio Grande he found thirty-seven points all but two being of "rough black quartzite," "the material most common in all that country" (glassy andesite?).

It is clear that glassy andesite, being a fairly good material for chipping, was used by whatever group of Indians was living in the vicinity. Apparently both Plains and Pueblo Indians used the area and that material.

These Plains influences were not evident in that part of the cave excavated and it would seem that a fair sample was secured. The occupation seems too extensive for an overnight camp of expeditions for coal for ornaments, etc., although the distance from the nearest Pueblo

[12] Roberts, 1929; Kidder, 1932, pp. 19–23; Jeancon, 1923, Pl. 16; Renaud, 1931; Strong, 1935, Pls. 24, 25. [13] Renaud, 1931, p. 23.
[14] Kidder, 1932, p. 72. [15] Roberts, 1931. [16] Renaud, 1935.

makes that a possibility. That one family lived permanently in the cave seems untenable due to the paucity of the variety of artifacts. Their character also would not seem correct if the cave were an adjunct to an open site.

The hypothesis best fitting the facts is that we have here a camp occupied periodically by hunting parties of Pueblo people. Piñon nuts are also abundant in the neighborhood. The pit might have been used for storage and the mano for cracking nuts, grinding food for storage, or working on hides. The utilized flakes would have been handy for cutting up the rabbits and deer they hunted and, if it were a temporary camp, little care would probably have been used in their fabrication. Also the lack of painted pottery would be explained: they would probably only bring their cooking pots. Camps such as this one were probably in the hinterland of most Pueblos.

BIBLIOGRAPHY

BRYAN, K., and A. P. BUTLER, JR.
1940. *Artifacts made of the Glassy Andesite of the San Antonio Mountain, Rio Arriba County, New Mexico.* University of New Mexico, Bulletin 349.

JEANCON, J. A.
1923. *Excavations in the Chama Valley, New Mexico.* Bureau of American Ethnology, Bulletin 81. Washington.

KIDDER, A. V.
1932. *The Artifacts of Pecos.* Papers of the Phillips Academy Southwestern Expedition, No. 6. Yale University Press. New Haven.

MERA, H. P.
1935. *Ceramic Clues to the Prehistory of North Central New Mexico.* Laboratory of Anthropology, Technical Bulletin 8, Santa Fe.

RENAUD, E. B.
1931. *Archaeological Survey of Eastern Colorado.* Denver.
1935. *Archaeological Survey of Eastern Colorado, Fourth Report.* Denver.

ROBERTS, F. H. H., JR.
1929. *Shabik'eschee Village.* Bureau of American Ethnology, Bulletin 92. Washington.
1931. *The Ruins at Kiatuthlanna, Eastern Arizona.* Bureau of American Ethnology, Bulletin 100. Washington.

STRONG, W. D.
1935. *An Introduction to Nebraska Archaeology.* Smithsonian Miscellaneous Collections, Vol. 93. Washington.

Andover, Massachusetts
December, 1941

NAVAHO ARCHAEOLOGY OF UPPER BLANCO AND LARGO CANYONS, NORTHERN NEW MEXICO

MALCOLM F. FARMER

UPPER BLANCO and Largo Canyons in Rio Arriba and Sandoval Counties, northern New Mexico (Fig. 5), are in an area known to modern Navaho Indians as *dinétah*, "Navaho country,"[1] "Navaho

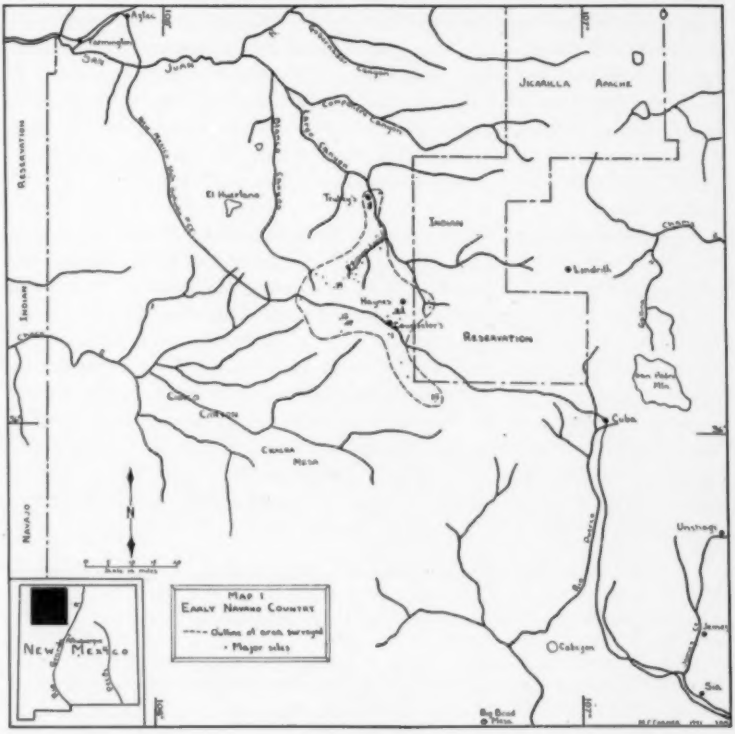

FIG. 5

homeland place,"[2] and is recognized by them as the homeland of their ancestors. A number of Spanish records also refer to it as Navaho country.[3] Anthropologists have, therefore, turned to the region as a source for data on the early Navahos. Surveys and some excavations of sites

[1] Haile, 1938, p. 38. Bibliography, see pp. 99–104 of this Journal.
[2] Harrington, 1940, p. 513. [3] See Kluckhohn and Spencer, 1940, pp. 5–10.

have been made.[4] The part of *dinĕtah* discussed in this article has been visited by field workers at various times and a number of sites located.[5] In July and August of 1938, a project was undertaken by the author to survey more extensively in the region and to excavate at some of the sites.[6]

Most of the sites were fortified. Towers of the upper Largo were strategically located on buttes and high points above the canyon and so placed in relation to each other that they formed a chain of observation points. Fortification walls were common. Buttes and mesa points often had walls along their edges or across narrow places. A wall two hundred feet long was located on a mesa rim in upper Blanco Canyon. Some sites were located in strategic positions in relation to trails. Site No. 22 commanded a wide view of a trail that was said by Navaho field assistants to have been used by Ute war parties as well as by Navaho travelers and raiding bands.

A number of petroglyphs were recorded, especially in Rincon Largo,[7] a western tributary of Largo Canyon. One group had been ground and pecked on the vertical face of a sandstone ledge. It included animal and bird tracks, crude animal and human figures, one of a man on horseback,[8] some geometric figures, and others that might be interpreted as ceremonial. Another group in the same canyon has been reported by Van Valkenburgh.[9] A figure in that group was said by Navahos of Fort Defiance, Arizona, to be that of a Navaho minor diety. At a fortified butte to the south of Blanco Canyon and overlooking the Chaco drainage, an hourglass-shaped figure was ground in the sandstone. This same figure is used ceremonially by modern Navahos in body painting and on artifacts.[10]

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[4] Among those who have worked in the area are A. V. Kidder in 1912, N. C. Nelson in 1916, E. H. Morris, Dr. H. P. Mera, W. S. Stallings, Jr., E. T. Hall, Jr., R. F. Van Valkenburgh, Dr. and Mrs. J. Y. Keur, R. L. Malcolm and F. C. Hibben. Bandelier records a number of earlier reports of the region.

[5] R. F. Van Valkenburgh, survey in 1936 and 1937, with intermittent visits since that time; Miss S. E. Murphey, survey and excavation in 1937; and C. T. R. Bohanan, survey in 1937.

[6] This article is a summary of "Field and Laboratory Reports; Archaeological Work Done in the Old Navaho Country, Summer of 1938," in manuscript. I wish to thank Mr. E. R. Fryer, Navajo Service, Window Rock, Arizona, for his interest and support of the project; Mr. R. F. Van Valkenburgh, Office of Indian Affairs, Field Service, Window Rock, Arizona; Dr. Clyde Kluckhohn, Harvard University; Dr. H. S. Colton, Museum of Northern Arizona, Flagstaff, Arizona; Mr. and Mrs. James Counselor, Counselor's, New Mexico; Dr. A. O. Farmer; the Navahos who assisted, and many others who were more than helpful. Labor was furnished by CCC-ID.

[7] Van Valkenburgh, 1941*a*, p. 123. [8] Keur, 1941, p. 63.

[9] Van Valkenburgh, 1938*a*, pp. 153–157.

[10] Matthews, 1902, p. 23, fig. 3. Franciscan Fathers, 1910, p. 367. Haile, 1938, p. 59.

An area of approximately two hundred and fifty square miles of mesa and canyon country was included in the survey. In the parts covered, twenty-nine sites were located. These gave an excellent picture of the occupation of the region by early Navahos. Data concerning the sites are brought together in Table I.

TABLE I
SUMMARY OF SITE DATA

Site Number	Dwellings					Temporary Camp Sites	Fortification	Fortified Butte	Ramada	Sweat House	Lean to's	Caches	Burials	Dance Grounds	Oven	Trash Dump	Petroglyphs
	Forked Stick	Cribbed Log	Circular Stone Wall	Stone Tower	Unit Type Stone												
1	3	–	–	–	–	–	–	–	–	1	–	1	?	–	–	x	–
2	2	–	–	1	–	–	x	x	–	–	–	–	–	–	–	x	–
3	2	–	–	1	1	–	x	x	–	–	–	–	?	–	–	x	–
4	?	–	–	1	1	–	–	–	–	–	–	–	–	x	–	x	–
5	4	1	–	–	–	–	–	–	?	x	–	–	–	–	–	x	–
6	?	–	–	1	1	–	x	x	–	?	–	–	–	–	–	x	–
7	–	–	–	–	–	x	–	–	–	–	–	–	–	–	–	?	–
8	–	–	–	–	–	x	–	–	–	–	–	–	–	–	–	–	–
9	–	–	2	–	–	–	–	–	–	–	–	–	–	–	x	x	–
10	–	–	2	–	–	–	x	–	–	–	–	–	–	–	–	–	–
11	2?	–	–	1	–	–	x	x	–	–	–	–	–	–	–	x	–
12	?	–	–	–	1	–	x	–	1?	–	–	–	–	–	–	x	x
13	5	–	–	–	–	–	–	–	–	–	x	–	–	–	–	x	–
14	1	–	–	–	–	–	–	–	–	–	–	–	–	x?	–	–	–
15	?	–	?	–	–	–	–	–	–	–	–	–	–	–	–	x	–
16	3?	–	–	–	–	–	x	x	–	–	–	–	–	–	–	x	–
17	4?	–	–	–	–	–	x	x	–	–	–	–	–	–	–	x	–
18	6?	–	–	–	–	–	x	x	1	–	–	–	–	–	–	x	–
19	3	–	–	–	–	–	x	x	–	x?	–	–	–	–	–	x	–
20	–	–	–	–	–	–	x	–	–	–	–	–	–	–	–	x	–
21	3?	–	–	–	–	–	x?	–	–	–	–	–	–	–	–	x	–
22	–	–	–	–	–	–	x	x	–	–	–	–	–	–	–	–	–
23	–	?	–	–	–	x	–	–	–	x	–	–	–	–	x?	x	–
24	–	?	?	–	–	x	–	–	?	x?	–	–	–	x	–	x	–
25	–	–	–	–	–	–	x	x	–	–	–	–	–	–	–	–	–
26	–	–	–	–	–	x	x	x	–	–	–	–	–	–	–	–	–
27	3?	–?	–	–	–	–	x	x	–	–	–	–	–	–	–	x	x
28	–	–	–	–	–	x	–	–	–	–	–	–	–	–	–	x	–
29	–	–	–	–	–	x	–	–	–	–	–	–	–	–	–	–	–

– = Absence x = Presence ? = Questionable

ARCHITECTURAL REMAINS

Forked Stick Dwellings. Forty-three dwellings of the forked stick type[11] in various states of preservation were noted during the survey. Later, one at Site No. 1 and one at Site No. 13 were excavated. The average diameter of dwellings was about 3.66 m. Those still standing were 1.82 m to 2.44 m in height. The exact arrangement of the forked logs could seldom be determined because of the poor preservation of the

[11] Page, 1937*b*, p. 47.

majority of the structures. It was determined, from those that were standing and from the relative positions of the timbers in the fallen ones, that there were from three to six main logs arranged in a conical framework, forked ends interlocked. The rest of the timbers were piled against this frame to form the walls. The doorway was to the east in most dwellings. Sometimes there was an entrance passage; in other cases the door posts were set on the perimeter of the circle of the floor area. Dwellings of the forked stick type were found at Big Bead Mesa, Guadalupe Canyon, New Mexico.[12] Dwellings of a similar nature have been reported from the southwestern part of Colorado in Uncompahgre Ute territory.[13] An excellent account of the Navaho manner of constructing this type of house is given by Mindeleff.[14]

The various features of the two excavated forked stick dwellings are recorded in Table II.

TABLE II[15]

Site	*#1*	*#13*
House type	Ic	Ic
Diameter	3.35 m	4.27 m
Floor	Sandy	Packed
Doorway	a, east	c, east
Position of Fireplace	dc	dc
Diameter of Fireplace	55.88 cm	66.04 cm
Presence of		
Deflector	x	—
Bin	S	—
Remarks	Metate on floor	Large chopper on floor

The amount of pinyon and juniper wood used in a forked stick dwelling was quite large. In the one excavated at Site No. 13 were the remains of twenty-one large timbers, some 3.05 m long and 25.4 cm in diameter at the base, and forty-eight smaller poles and sticks. The final covering must have used up many more.

Trash Dumps. At many of the sites there were trash dumps or ash heaps[16] where ashes, floor sweepings and other trash from the dwellings had been deposited. Frequently, the trash dump was 2 m to 3 m northeast of the doorway of the dwelling, but there was no regularity in the location. Trash was often dumped around the bases of towers and on the talus of fortified buttes. A very good example of the latter type was found at Site No. 17. Because of the amount of debris and the apparent depth of the deposit, a test trench was dug in the fill. The trench was approximately 4.25 m long, 1.0 m wide, and 1.2 m deep. The strata of the debris were mixed and irregular, containing lenses of ash filled soil, bits of charcoal, broken rock, fragments of bone, potsherds, corncobs,

[12] Keur, 1941, pp. 21–34, Tables B, C and D.
[13] Wormington, 1940, and 1941.
[14] Mindeleff, C., 1898, pp. 487–493.
[15] Symbols as used in Keur, 1941.
[16] Keur, 1941, pp. 36–37.

and whole and broken artifacts. The time span represented by the deposit did not seem to have been very long. No changes in the occupation of the site were indicated. There was, however, more deer bone in the deepest part of the fill. Other bones were identified[17] as jack rabbit, wood rat, squirrel, sheep and horse. The incisor tooth of a porcupine was also found.

Other Architectural Remains. Although forked stick dwellings were a particular objective of the work, other structures important to the whole picture of the area were visited. The towers of crudely coursed sandstone slabs are an impressive structure of the area. A very fine example was seen at Site No. 3 in Largo Canyon near Trubey's,[18] seventeen miles north of Counselor's.[19] It was situated on a flat bench on the west side of the canyon about five hundred feet above the canyon floor. The structure was two stories high, with four rooms, and an additional room built against the east side of the butte on which it stood. The butte was of sandstone and about 2.44 m high and 4.27 m in diameter. The tower was between 3.66 and 4.27 m high and roughly circular, the wall following the outline of the butte. The additional room was 3.35 m by 2.13 m, the base of the butte forming one wall. Entrance to the tower was through the roof of the lower room and a doorway in the east side of the tower. The sandstone slabs of the walls were set in an abundance of mud and plastered, inside and out, with the same material. The tower was very well preserved. Only part of the southwest wall and a part of the roof had collapsed. Of the lower room, only the walls and some roof beams remained. The tower roof had beams of heavy pinyon logs, covered with a layer of smaller timbers, a layer of brush, and a final layer of sandstone slabs. The whole may have been covered with a layer of earth. A low parapet had been built around the top. The inside of the tower was divided into four semi-circular rooms by a north-south partition and a second floor. A hooded fireplace in the lower west room connected with a chimney leading out through the corner of the room directly above. Through the ceiling of the upper west room was an opening, large enough for a man to climb through, which gave access to the roof. There were a number of loop holes in the walls, but no windows. Just below the tower on the west side were the remains of two forked stick dwellings. Pottery at the site indicated a date in the 1700's.

The association of towers and other Pueblo-like structures and hogan-like dwellings has been observed in the Largo, Gobernador, and other canyons in the region by Kidder and others.[20] Kidder suggests that the

[17] Bones identified by Dr. H. Howard, Los Angeles Museum, Los Angeles, California.
[18] Van Valkenburgh, 1941*a*, p. 161. [19] *Ibid.*, p. 44.
[20] Notably Kidder, Nelson, Morris, Mera, Hibben, and Keur.

stone structures may have been built by Pueblo people from the Rio Grande valley who took refuge in *dinétah* after the Pueblo Revolt against the Spanish in 1680[21] and that the hogan-like structures were made by Navahos or other people who built similar dwellings.[22] From the character of the remains and the associated pottery and artifacts, the Navaho seem to have been the ones who built the forked stick dwellings near the Pueblo-like structures. There is evidence, however, that the Navaho themselves took over the tower building complex. In a letter of Ugarte y Loyola written in 1788, he tells of the Navaho building " . . . ten rock towers within their encampment. . . . "[23] The origin of the tower complex is far from clear. Towers had a wide use in earlier times in southeastern Utah and southwestern Colorado[24] and in parts of northwestern New Mexico.[25] Closely related to the problem is the architecture of the dwellings of the Largo phase as reported by Mera[26] and the Gallina phase reported by Hibben.[27] Also patent to the question are the Spanish traits in the towers of the 1700's. The hooded fireplace and the stone slabs on the roof are possible traits of this class.[28] The Spanish also built towers. Two photographs of a very interesting tower at Manzano, New Mexico, assigned to Spanish origin have been published in *El Palacio*.[29] This tower is circular with a diameter of about 4.88 m and a height of about 4.57 m. It has a doorway about 1.83 m above the ground which is reached by steps. The construction is roughly coursed stones set in mud and the outside may once have been plastered with mud. The roof beams are covered by a layer of timbers and a layer of rock slabs.

Two circular, uncoursed sandstone walls about 1 m high and 2.75 m in diameter, one abutted against a large boulder, were located at Site No. 9 in Rincon Largo. These are of the type discussed by Malcolm from the Chaco region.[30] Mrs. Keur found the type at Big Bead Mesa. Because of their location and the pottery found, the ones in Rincon Largo seem to be fairly recent.

There are a number of very recent Navaho camps in the region, many of them in use at the present time. These were noted but not studied at the time of the survey. However, some of them are important. Two were examined which related to the work. One cribbed-log dwelling[31] of a late date was near some older forked stick dwellings and sweat

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[21] Reiter, 1938, Vol. II. [22] Kidder, 1920, p. 329.
[23] Ugarte y Loyola, 1788. [24] Fewkes, 1919. [25] Hibben, 1937; 1938.
[26] Mera, 1938. [27] Hibben, 1938. [28] Mindeleff, V., 1891, p. 168.
[29] Anonymous, 1923, and 1925. [30] Malcolm, 1939, pp. 6–11.
[31] Page, 1937*b*, p. 48.

houses[32] at a site near Haynes, some four miles north of Counselor's. There was also a bake oven of rock at the site. There was a trading post at Haynes about thirty years ago and some of the dwellings were in use then. Another cribbed-log dwelling was in a small rincon west of Site No. 1. This one was about 4.88 m in diameter and built of pinyon and juniper logs and poles. All of the more recent dwellings and the ones used by the Navahos in the area today are of the cribbed-log type with some modern square houses showing Mexican and American acculturation.

TREE-RING MATERIAL

Tree-ring specimens were obtained from timbers at a number of sites, but the material was far from satisfactory. However, it gives some idea of the period represented by the remains.[33] No satisfactory material was obtained at Site No. 1. From Site No. 13, two dates were determined: 1762 ± 15 A.D. from the excavated dwelling, and, from another forked stick dwelling at the site, 1725 A.D. (outside dated ring) with an unknown number of rings lost on the outside. One date was obtained from a log found in a crevice at the north end of the small mesa at Site No. 17: 1745 ± 10 A.D. These dates give a possible range for the two sites of 1735 to 1777 A.D. The range of dates from Big Bead Mesa are 1673+X to 1812 ± 20 A.D.[34] Stallings has reported on tree-ring dates for some tower sites excavated by E. H. Morris in *dinétah*.[35]

Site No.	*Name*	*Cultural Stage*	*No. of Specimens*	*Range of Dates*
L.A. 1868	Gobernador Canyon	Pueblo V	1	1732–33
L.A. 1869	San Rafael Canyon	Pueblo V	1	1752 ± 3
L.A. 1872	San Rafael Canyon	Pueblo V	1	1737 ± 10
	San Juan Canyon	Pueblo V	2	1723 ± 1
	Miscellaneous			1727 ± 1

The towers seem to date mostly in the 1700's with forked stick dwellings before, during, and after this century.

ARTIFACTS

Two basic types of metates were found, a slab, and a trough open at one end. They had the same distribution, but the trough type seemed to be more common at camp sites. A very good example of the slab type was found at Site No. 18 in upper Blanco Canyon. It was of reddish sandstone, rectangular in outline and cross-section, with slightly rounded ends. It was 52 cm long, 26.5 cm wide and 7.5 cm thick. A much

[32] Page, 1937*a*.
[33] Dates by H. T. Getty and E. T. Hall, Jr.
[34] Keur, 1941, p. 68.
[35] Stallings, 1937, p. 3.

smaller and thinner metate of the same type was found on the floor of the dwelling excavated at Site No. 1. No whole trough metates were found. Fragments of the type, however, indicated about the same dimensions as the slab type, perhaps a little thicker. All the metates were of sandstone.

Manos were of two general types, oval and rectangular. The oval is usually of sandstone and used on one or both faces. One of granite was found. A typical specimen was 17.1 cm long, 9.5 cm wide, and 3.8 cm thick. The rectangular "two-handed" type is long and narrow. These often have a longitudinal ridge on one face making a triangular cross-section. One typical specimen was 23.3 cm long, 8.4 cm wide, and 3 cm thick. Sandstone is the usual material.

Two types of hammerstones were found during the survey and at excavated sites. One is a spherical rock used as it was picked up; the other a rock adapted for use by percussion flaking. Common size for both is about 6 cm by 5 cm. The flaked ones are usually rather flat.

Shaft smoothers were found at a few sites. They are rectangular in outline and cross-section and had a longitudinal groove on one face. Reddish sandstone was the usual material. These shaft smoothers are of the type used in pairs and are found quite commonly on sites of the Great Plains. They are sometimes termed the "nail-buffer" type. Strong reports them from Nebraska,[36] and Kidder found the type at Pecos.[37]

A shaft polisher, or perhaps a straightener, was found at Site No. 11. It is of a mottled gray rock, 8.4 cm long, 5.9 cm wide, and 4.7 cm thick. It has a plano-convex cross-section, with a longitudinal groove on the rounded side. The rock was discolored, perhaps by heat, as the tower ruin where it was found showed signs of fire.

Thirty-two projectile points in all were found in the excavated remains and during the survey (Table III). There was no general type. Materials included obsidian, chert, chalcedony, and petrified wood. The workmanship varied from crude to fairly good with no correlation as to type. Some points seem to have been reworked. One triangular point of black obsidian, with a straight base and two side notches, had been blunted, making a chisel-edged point. The average length is about 3.5 cm.

The ordinary type of scraper from the sites is a primary percussion flake with a little secondary flaking on one edge. These crude tools may also have been used for cutting. One snub-nosed end scraper was found at Site No. 19 in upper Blanco Canyon.

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[36] Strong, 1935, p. 86. [37] Kidder, 1932, pp. 80–82, Fig. 56.

TABLE III[38]

PROJECTILE POINTS

Type		*Surface Find*	*Excavated*
Not stemmed			
Leaf shaped, base rounded	(NAb_1)	1	
Triangular, straight base, rounded corners	(NBa)	1	1 (#1)
Triangular, straight base, concave edges	(NBa)		1 (#17)
Triangular, straight base, two side notches	(NBa)	4	2 (#17)
Triangular, concave base	(NBb)	1	
Triangular, concave base, two side notches	(NBb)	4 (1:#17)	
Stemmed			
Contracting stem, shouldered only	(SAa)	2 (1:#17)	
Contracting stem, shouldered only, notched base	(SAa)	2	
Contracting stem, shouldered only, slightly convex base, two side notches	(SAa_1)	1	
Parallel sided stem, shouldered only, slightly convex base	(SBa_1)	1 (#13)	
Expanding stem, shouldered only, straight base	(SCa_2)	2 (1:#17)	
Expanding stem, shouldered only, convex base	(SCa_1)	2	
Expanding stem, shouldered and barbed, straight base	(SCb_2)		1 (#1)
Expanding stem, shouldered and barbed, convex base	(SCb_1)	2 (1:#13)	
Unclassified		2 (1:#13)	2 (#1, #13)

The various artifacts found in the region of upper Blanco and Largo canyons are similar to those found at Big Bead Mesa.[39]

Corncobs found in the excavations and on many of the sites indicate rather poor crops. The ears are small, usually with eight rows of kernels. There was, however, quite a number of corncobs, so perhaps quantity may have made up for quality.

TABLE IV

ARTIFACTS FROM EXCAVATED SITES

	Site #1		*Site #13*		*Site #17*		
	*S.**	*Ex.†*	*S.**	*Ex.†*	*S.**	*Ex.†*	*Total*
Flakes, rejects, cores	4	7	12	12	3	10	48
Scrapers, knives	—	2	—	—	—	1	3
Points	—	3	3	1	4	4	15
Choppers	—	—	1	2	1	—	4
Drills	—	—	—	—	—	1	1
Hammerstones	—	2	2	2	7	—	13
Axes	—	—	—	—	—	—	0
Mauls	—	—	—	—	—	—	0
Manos	1	1	2	—	1	—	5
Metates	—	1	—	1	—	—	2
Shaft smoother	—	—	—	—	—	3	3
Rubbing stones	—	1	—	—	—	3	4
Concretions	—	—	1	—	—	—	1
Worked bone	—	1	—	—	—	5	6
Antler	—	—	—	—	—	3	3
	—	—	—	—	—	—	—
Totals	5	18	21	18	16	30	108

* S. = surface find. † Ex. = excavated.

[38] Table arranged according to classification scheme of Gifford and Schenck, 1926, pp. 80–81, and Strong, 1935, pp. 88–89. The numbers in parentheses are the site numbers of the 1938 Survey where the points were found.

[39] Keur, 1941, pp. 56–62.

Animal bones found during the work included those of the following species: deer, cottontail rabbit, jack rabbit, antelope, porcupine, wood rat, squirrel, horse, sheep and cattle. Deer bones were the most plentiful; those of rabbits, the next. Remains of domestic animals were not common.

Although no burials were located during the survey or in the excavated remains, a number of places were noted where a more thorough search would perhaps have resulted in the finding of some skeletal material. A number of crevices in the edges of the mesas would have been possible burial places.

POTTERY

Broken pottery was found on the surface at most of the sites and in the excavations. Two major groups of types were represented, those believed to have been manufactured locally, and those traded. Of the local pottery types, there were examples of plain and decorated wares. From the sherd samples, a number of types and sub-types were classified of which only the main ones will be given here. The first of these is a plain gray pottery which has been termed Dinétah Scored. It was made by spiral coiling and then the coils obliterated by scraping the exterior and interior. The core is dark gray, sometimes with a gray center and darker margins. It contains medium sized irregular fragments of quartz and some mica. The fracture is irregular, sometimes crumbly. It may be potsherd tempered. Walls vary from 5 mm to 6 mm in thickness. The exterior surface color is various shades of gray with some fire clouds. The interior is gray. The exterior is scraped diagonally with a tool that left many regular striations. The rim is slightly flared with rounded margin. Shapes include wide-mouth jars with rounded or pointed conical bottoms, sometimes indented. A small, seed jar shape was common in one variation of the type. The rim sherds of jars sometimes had small notches broken in the edge. One jar sherd with a vertical oval neck lug was found. Decoration was limited to the rare occurrence of small fillets of bits of clay pressed into the surface of the neck and pushed sideways. One sherd had a decoration of a row of fingernail indentations. Of a total of 1054 plain sherds examined, 513 were Dinétah Scored. The type was found at all sites and in the excavations. A whole vessel of this type was found cached at Site No. 1. It seems to be the same type described by Malcolm from the Chaco region,[40] by Kidder as Blackware from the Gobernador and Largo sites,[41] and by Mrs. Keur as Navaho Utility Ware from Big Bead Mesa.[42] It is quite similar to later Navaho pot-

[40] Malcolm, 1939, p. 12.
[41] Kidder, 1920, p. 325.
[42] Keur, 1941, pp. 46–47.

tery[43] and is thought to be ancestral to it. The diagonal striations on later Navaho pottery were made with a corncob used as a scraper.[44]

The second most common type, eighty sherds, is one that may or may not be of local origin. The number of sherds from the excavated sites possibly indicates some local manufacture. It is a brown pottery with fairly thick walls, spiral coiled with the interior surface scraped and smoothed. On the exterior surface, the coils are smoothed but only partially obliterated, making an irregular surface. The core is grayish-tan with tan margins and contains small irregular quartz particles, some black angular fragments, and some mica. The fracture is irregular. Thickness ranges from 6.5 cm. to 8.5 cm. The major shapes seem to have been a small jar and some larger jars with rounded or pointed conical bottom. Both had flared rims and rounded rim margins. It may be related to Gallina utility ware.[45] The best examples of the type were found at Site No. 15 with some other Gallina-like material, i.e. a leaf-shaped blade of white chalcedony with two side notches, one on each side halfway between point and base. This is a characteristic artifact of the Gallina phase.[46]

A number of types of local decorated pottery were found. The largest group is red-and-black-on-orange, sixty-six of 175 sherds. This type seems to be an outgrowth of Gobernador Polychrome.[47] Some sherds are polished on both surfaces; some are merely smoothed. The polished variety is closer to Gobernador Polychrome. The core of this type contains some angular white and gray fragments, some quartz, and may be potsherd tempered. The texture is medium fine. Vessel walls are strong with a fairly regular fracture and a range of thickness from 5 mm. to 7 mm. Exterior surface color is usually an orange-tan; bottoms are usually slipped red. Interiors are yellow-orange to orange. Decoration is geometric in design with plain black lines, wide red bands outlined with black, and solid triangles, sometimes with a hook or a cross at their apex. The usual shape is a deep bowl with a shoulder and a slightly concave region between the shoulder and rim. Some sherds indicate a jar form. Decoration is usually on the exterior in the concave area, but interiors are sometimes decorated. Rim margins are painted red. The surfaces of this type very often scale. The type was found at twelve sites. It was weakly represented at Big Bead Mesa.[48] This type may be related to the second type described by Tschopik in his paper on Navaho decorated pottery[49] as having a lusterless orange-buff ground color and painted with thin matte black or with matte black and brick red.

[43] Hill, 1937. [44] Observed in use, Canyon de Chelly, Arizona, 1935.
[45] Mera, 1935, pp. 8–10. [46] Hibben, 1938, pp. 134–135.
[47] Kidder and Shepard, 1936, p. 373; Keur, 1941, p. 47.
[48] Keur, 1941, p. 48. [49] Tschopik, 1941, p. 70.

The second decorated type is a dull red-on-tan. It is represented by only a few sherds from one site. The paste and other characteristics are similar to Gobernador Polychrome, but the surface is more buff, both exterior and interior, and it has naturalistic designs in a dull reddish brown paint on the exterior. The general appearance of this type is similar to the first style of modern Navaho decorated pottery as determined by Tschopik.[50] He describes it as ". . . characterized by an orange to buff, lusterless ground painted in dark red-brown . . ." The third decorated type, a red brown-on-orange buff, is related to the other two types but shows some differences as to thickness of walls, shapes, and decorations. It has the crudity of modern Navaho decorated pottery.[51] A fourth type, a polished red with black line decoration was represented by a few sherds. These were of a globular, small mouthed jar with slightly flaring rim. There was a line around the neck with a series of short vertical lines from it towards the rim and diagonal lines in a group of three down the side. Some drops of reddish-orange paint had been spilled on the interior. The exterior color and finish were similar to a vessel found by the author in Canyon de Chelly, Arizona, in 1935. This specimen, however, was a small bowl and undecorated. The rim had been pressed in on four sides making the orifice square with rounded corners. This trait was noted on an example of the first decorated type from a Largo Canyon site. A fifth type, a dull red and brown on a dull reddish background was found associated with Dinétah Scored in the trash dump at Site No. 17. Its paste is related to Gobernador Polychrome, but the design is broad red lines on the interior and dull black lines on the exterior on a smoothed, dull reddish-tan background. The shape was a shallow bowl, almost a tray.

The intrusive pottery included 106 sherds from six sites indicating influences on *dinétah* from the Upper Rio Grande region, the Jemez region, the Middle Rio Grande, and the Little Colorado or Acoma-Zuni region.[52] The Upper Rio Grande is represented by Pojoaque Polychrome and perhaps some other Tewa Polychrome derivatives. The Jemez region is represented by a sherd of what may be Jemez Black-on-white,[53] found on the surface at Site No. 17. From the Middle Rio Grande, there is Puname Polychrome. The Little Colorado region is represented by Ashiwi Polychrome.

Two groups of sherds resemble material illustrated by Kidder from Pecos.[54] These had the unpaneled repeated figure bands with the common semi-circle element. One was a single red line on a white back-

[50] *Ibid*, p. 70. [51] *Ibid*, Pl. VIII.

[52] Areas as outlined in Mera, 1939. [53] Reiter, 1938, pp. 123–153.

[54] Kidder, 1931, pp. 131–150; Kidder and Shepard, 1936, pp. 374–380.

ground. The other had double black lines on a cream-white background. Between the lines was a row of dots. The angles formed by the base line and the inside of the semi-circle were filled with black paint for a short distance with a narrow black line parallel to its edge. These sherds may be of the Tewa Polychrome group.

In addition to these types, there are some that are difficult to place as to possible origins. One is a dull red and brown-on-cream white. The line work is very fine. It may be from the Acoma-Zuni region. The type has also been found on some Navaho sites of the early and middle 1800's in the region just north of Fort Defiance, Arizona.[55] Another type has a red slipped bottom with black-on-white decoration above the shoulder. The interior is gray, unslipped, and shows scraping marks. It is very well made. A third is black and red-on-white, with a yellowish slip on the interior. It may be from the Little Colorado region of the time when the people there were trying to make copies of Hopi pottery.[56] One type had a particular significance because it was found associated with Dinétah Scored and the fifth local decorated type described above, in the trench at Site No. 17. It is black and red-on-white, with the interior slipped red and well polished. It was a bowl shape with slightly incurved and flattened rim. This shows possible Tsia Polychrome influence.

A pottery type that shows some Spanish or other non-Indian influence was found on the surface at Site No. 17. It was part of a small hemispherical bowl with a raised ring base.

The pottery found during this work, and that from other sites on which published data are available is arranged in Table V to show the geographical extent of the various types.

CONCLUSION

A great deal of work has yet to be done in *dinétah* and vicinity to solve its many problems. The reconstruction of Navaho history by means of archaeological techniques is just being established and promises to be interesting and informative. There is, in this material, the opportunity to study cultural dynamics with much supporting data from ethnological and historical sources. The recent paper on Big Bead Mesa in New Mexico is a start in this direction.

Pueblo Indian refugees from the Rio Grande region were in *dinétah* after the Pueblo Revolt of 1680 which gave a very good opportunity for the Navaho to borrow many Puebloan elements. This must have had important effects on the Navahos. Reiter,[57] in his report of work at the Jemez Pueblo of Unshagi, New Mexico, gives a number of refer-

[55] Author's field notes, 1938. [56] Mera, 1939. [57] Reiter, 1938.

TABLE V

ASSOCIATION OF POTTERY BY AREAS

Pottery Types	*Gobernador Canyon (Kidder, 1920)*	*Lower Largo Canyon (Kidder, 1920)*	*Upper Largo Canyon*	*Upper Blanco Canyon*	*Big Bead Mesa (Kent, 1941)*	*Chaco Canyon (Malcolm, 1939)*
Dinétah Scored	X	X	X	X	X	X
"Early Navaho" Polychrome	X	X	X	X	X	X
Gobernador Polychrome	X	X	X	X	X	—
Ashiwi Polychrome	—	—	X	—	X	X
Puname Polychrome	—	—	X	X	X	—
Tewa Polychrome	X	X	—	—	—	—
Pojoaque Polychrome	—	—	X	—	—	—
Ogapoge Polychrome	—	—	X	—	—	X
Jemez Black-on-white	—	—	X	—	—	—
Gallina Utility(?)	—	—	X	—	—	—
Three Color Glaze Ware (Rio Grande type)	X	—	—	—	—	—
Early Historic Glazed Ware	X	—	—	—	—	—
Black-on-yellow or pink (Keresan region)	X	—	—	—	—	—

ences to people from the Jemez region going into the old Navaho country. A number went in 1696[58] to escape the returning Spaniards. They were reported living among the Navaho in 1705.[59] There is also the relationship of early Navaho to earlier Anasazi and related people, particularly to the Largo phase[60] and the Gallina phase.[61] The building of towers and the use of conical bottom pottery and Gobernador Polychrome pottery may be indications of connections. It may be that remnants of these people were among those who joined the early Navaho as is told in the genesis legend. Jenness[62] has recently suggested that the Athabascans came south from western Canada as early as 1000 A.D. and introduced bows and arrows and the Mongoloid physical strain in Pueblo I (Developmental Pueblo) times. This offers interesting possibilities, but will need a great deal of evidence to substantiate it.

Influences from other regions, as shown by the dwellings, pottery, and artifacts, also had some effects. The distribution of forked stick dwellings in Colorado and Utah show connections with the Intermontane Area.[63] This connection may be strengthened by the plain utility pottery. Promontory Ware found at Great Salt Lake, Utah, has some similarities to earlier and later Navaho types.[64] Steward has recently suggested the possibility that the Promontory people were Athabascans

[58] Bloom and Mitchell, 1938, p. 107. [59] Hodge, 1916, p. 244.
[60] Mera, 1938. [61] Hibben, 1938. [62] Jenness, 1940, p. 387.
[63] Spier, 1928, pp. 180–182. [64] Steward, 1937*a*, p. 44.

because of a number of northern traits in their culture and because they appeared in the area rather suddenly, probably at about 1000 A. D. Anasazi sites in the region were abandoned about the same time or soon after.[65] This is in agreement with what Jenness considers the time that the Athabascans were coming into the Southwest.[66] Navaho connections with the Intermontane Area have also been noted by Harrington.[67]

Plains traits are also present. It may be, however, that instead of acquiring these traits in the Plains proper, the Navaho received them after they arrived in the Southwest as a part of a general Plains influence that came west and was felt by the Pueblo people as well as the Navahos. The possible origin of the conical bottom pottery in the "Woodland" pottery[68] or its relationship to pottery of a similar character from sites on the Dismal River in Nebraska and adjacent regions in remains of the protohistoric period[69] needs a great deal more investigation from both the Navaho and the "Woodland" points of view. Other traits such as the arrowshaft smoothers strongly suggest the Plains connections. These implements, however, are also found in the Intermontane Area.[70]

As has been pointed out previously[71] there is a great need for "dirt" archaeology relative to the early Navaho, and all the possible relationships to other areas and cultures must necessarily remain mostly speculation until concrete evidence is uncovered. Jenness has pointed out the danger of a reconstruction of native history based too extensively on ethnological and linguistic evidence.[72]

San Diego Museum
San Diego, California
July, 1941

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[65] Steward, 1940, pp. 472–474. [66] Jenness, 1940, p. 387.
[67] Harrington, 1940, p. 523. [68] Mera, 1938. [69] Keur, 1941, pp. 55–56.
[70] Steward, 1940, p. 470. [71] Keur, 1941, p. 1. [72] Jenness, 1940.

ATHAPASKAN[1] MIGRATION VIA THE INTERMONTANE REGION

BETTY H. and HAROLD A. HUSCHER

CIRCULAR or sub-rectangular stone structures, often with dry-laid masonry walls and characteristically built in prominent locations, have been reported[2] from sites ranging from the Plains across New Mexico and Arizona as far as California.[2] West of the Rocky Mountains they have been reported from the Paradox Valley east of the La Sal Mountains, and several writers have noted comparable structures in northeastern Utah, sometimes standing alone and sometimes in supposed association with Puebloid remains.[3]

Recent survey by the Colorado Museum of Natural History has shown the occurrence of hogan-like structures falling in this same classification, in the Rockies from the San Luis Valley on the south, where one site already had been reported[4] but classed with tipi rings, across the Gunnison and Colorado drainages as far north as the headwaters of the White River.[5] At some sites there is definite evidence that the occupation was contemporaneous with Developmental Pueblo to the south, at others, preservation of wood in unprotected places and lack of dirt fill suggest a considerably later survival.

In the last few years Steward[6] and Harrington[7] have discussed the possibility that Southern Athapaskan tribes had come southward by way of the Basin or Intermontane region. The question of prehistoric Athapaskan movements, of course, is inextricably bound up with questions of the final withdrawal southward of the Pueblo proper, 650 years ago, and of the arrival of recent Shoshoneans from the west at some undetermined later date. Essentially, we have here a problem in time relationships between three large scale population drifts—actual group movements and not just the diffusion of a few related traits.

A Southern Athapaskan tribe, the Navaho, is the only surviving group in the southwest using circular houses of dry-laid masonry.[8]

[1] Harrington (1940) suggests Athapaskawan as more nearly correct. Bibliography, see pp. 99–104 of this Journal.

[2] Renaud, 1931, pp. 95–98; 1932, pp. 9, 11–18; 1935, pp. 13–15; Thomas, 1935, p. 266, fn. 38; Moorehead, 1921, pp. 1–11; 1931, especially pp. 116–117, Figs. 53–56; Pearsall, 1939, p. 8; Tanner, 1936; Colton, 1920, pp. 298–300; Kidder, 1924; Nelson, 1924. Cf. Steward, 1933, p. 334; 1941, pp. 334–335.

[3] Woodbury and Woodbury, 1932, pp. 11, 14, 17; Morss, 1931, p. 28; Reagan, 1933, pp. 5–6; Gillin, 1937, p. 218; Wormington, 1939, and 1940.

[4] Renaud, 1935, p. 7. [5] Huscher and Huscher, 1939, and 1940.

[6] 1936, p. 62; 1937*a*, p. 87. [7] 1940, p. 523.

[8] Malcolm, 1939, p. 11, Type 1.

However, Harrington, in his recent summary, shows that the now scattered Navaho bands all trace back to a single locale in northern New Mexico at about 1500 A. D.[9] The more widely distributed stone-walled ruins we are discussing, then, are not necessarily Navaho or "Early Navaho," though they still may be explained, and plausibly, as recording the actual house type brought south, in slightly differing versions, by the several migrating Athapaskan bands.[10]

Writers from Escalante's time onward have described "fortifications" in Colorado, supposedly built by recent Ute Indians,[11] but there is no real evidence for ascribing any masonry remains, other than an occasional jerry-built hunting blind, to the Ute.

Judging from identifiable sites we have seen, only a few years before the visits of Powell, Barber, and Jackson, most Ute camps must have been indistinguishable from the miserable assemblages of brush and bark huts Hiller photographed among the Kaibab and St. George Paiute.[12] Their culture must still have been at the same subsistence level, differing only as game was more plentiful nearer the main ranges.[13]

The time factor, also, is against any hypothesis of Ute influence in this region as early as Developmental Pueblo times, though here the evidence is less conclusive.[14] Indications are that the Ute are comparatively recent arrivals from the west and that their principal contacts have been, not with the Pueblo, but with the Apache-Navaho. The Navaho share many culture elements with both the Ute-Paiute and the Pueblo,[15] the inference being that for many centuries the Apache-Navaho have occupied their historic buffer position.

[9] Harrington, 1940.

[10] The name "Navaho" identifies only a single Apache group, "Los Apaches de Nabahó," after their certain differentiation from ancestral Athapaskan. Without positively identifiable cultural indices the name cannot be extended to ruins falling outside known Navaho areal-temporal limits. Hodge (1895) outlined the opposing view that the single nuclear Navaho clan was composed of Athapaskan-speaking Cliff Dwellers distinct from the Apache.

[11] Harris, 1909, p. 141; Chapin, 1892, p. 51. Cf. Morss, 1931, p. 28.

[12] Steward, 1939, Pls. 9, 21.

[13] After 1700, horses, tipis and travois figured prominently in the annual Ute parades across the mountains to raid, to hunt, or to trade, but this Plains veneer was comfortably shed when at home on the juniper mesas of Western Colorado. Huscher and Huscher, 1939 and 1940.

[14] Steward, 1936, p. 62; 1941, p. 454; Smith, E. R., 1940, p. 344.

[15] Gifford, 1940. In early historical times, the material culture of the Plains Apache bands and the Navaho was almost identical, both corresponding closely with that of the neighboring Pueblo (estimate based on documentary evidence edited by Thomas, 1932, and 1935; Hill, 1940). Archaeologically important differences would be the lack of the kiva complex and, among the Plains Apache, emphasis on the palisade house and the apparent lack of weaving and painted pottery.

On the other hand, if the Southern Athapaskans came south, as in all probability they did, in a gradual infiltration of related, but discrete, small bands of hunters, the individual bands having varying degrees of contact with the retreating Pueblo and the advancing Ute-Paiute, we should expect to find exactly the sort of evidence we have listed. Supposing these hunters to have been using originally some fairly substantial, circular winter house, their sites should show every possible degree of intergradation between the sketchiest ancestral "proto-hogan" and the truly Puebloan house with adobe-laid masonry. The earlier sites should hardly be expected in open valleys or on plains because a northern hunting people, conditioned to life in a subarctic climate, naturally would stay near main ranges or at least along the higher foothills where their former environment would be more nearly approximated.[16]

Since 1939 the writers have been checking reports of circular and sub-rectangular, dry-laid stone walls in western Colorado for evidence of possible Early Athapaskan origin, perhaps establishing actual Athapaskan migration routes.[17] Our survey has located a total of nearly 175 individual structures seeming to fall in this general classification, scattered in twenty-six widely distributed sites, many at high altitudes on or near mountain passes. The buildings may occur singly, in adjoining pairs with a common wall, or in planless villages of up to twenty buildings. They may be built on canyon rims, on the tips or sides of promontories overlooking valley floors, or may be perched on large talus boulders. A high percentage will incorporate a large boulder or rock-ledge into one wall, usually the north or south wall, in which case the floor plan will be D-shaped. Again, the houses may be dug into a rocky hillside with a south or east exposure, only the sides and front being built up, in which case the floor tends to be oval, the long axis of the oval paralleling the contour of the hill. These ruins may or may not be related to dry-laid stone walls blocking the mouths of caves, or dry-laid walls partitioning caves into "rooms," also noted from these areas.[18]

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[16] At the opening of the historical period the Apache-Navaho were still hill people, poorly oriented to life in the valleys. Characteristically, the Apache-Navaho boundaries, and Comanche-Ute as well, were delimited by rivers. Plains Apache guides were moved almost to tears at the prospect of being lost on the open prairies away from the protecting hills. Thomas, 1935, pp. 66, 11. See also Thomas, 1932; Hill, 1940. However, cf. Harrington, 1940, pp. 523–524.

[17] Huscher and Huscher, 1939 and 1940. The 1940 expedition was aided by a grant from the Permanent Science Fund of the American Academy of Arts and Sciences. The 1941 expedition is continuing with aid from the Penrose Fund of the American Philosophical Society.

[18] Woodbury and Woodbury, 1932, p. 11; Hurst, 1939, p. 59, but attributed to the Ute; Pearsall, 1939; Huscher, 1939, p. 30; Huscher and Huscher, unpublished field notes.

Wide variations were noted in the quality of the stonework but examination showed much of the variation to be due to the quality of available building material. In the great lava flows, walls were of rounded basalt "niggerheads,"[18] about as unsatisfactory for building purposes as so many billiard balls, yet in a surprising number of instances truly vertical wall remnants may be identified. At certain canyon rim sites where the quartzitic sandstone rimrock joints out in long narrow billets, the stone may be laid up cordwood fashion, the rounded corners turned by using a series of wedge-shaped billets.

The terms dry-laid masonry or masonry without mortar carry an entirely unjustified connotation of careless workmanship. Actually, it is technically more difficult to lay a permanent wall without mortar than with mortar. Try it sometime and you will be inclined to agree with Robert Frost that,

> Something there is that doesn't love a wall,
> That . . . spills the upper boulders in the sun.

The best preserved example of dry-laid masonry we have seen, and we are adopting it as a type, is a small ruin, a single oval room, perched on a talus boulder near the floor of a canyon in southern Montrose County. Here the walls are truly vertical, the curves evenly laid out. The material is selected, but apparently untrimmed, sandstone slabs, laid in courses with most joints broken, chinked with smaller rocks.

If we argue a southern origin for the type of masonry we have been describing, the lack of mortar is a little hard to explain because the use of adobe mortar has been universal in the southwest since Basketmaker times. Dry masonry is exactly what we would expect, however, if the house type originally had been developed by tribes in the north. In cold climates where mud daubing is loosened by freezing in the winter a chinking of bark or other organic material is commonly used instead.

Granting a northern origin for the house type, the very persistent trait of building in prominent locations might be traced to the use of windswept, snow-free sites rather than to any thought of defensive measures. Many of the "fort" sites we have examined were clearly vulnerable to attack from higher ground only a few feet to the rear. Within historic times the Navaho are known to have fortified certain populated mesa tops, but generally speaking, the Apache-Navaho tendency has been to build villages in isolated locations rather than to plan for their defense. Villages under attack ordinarily were abandoned

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Cf. Smith, H. I., 1910, pp. 518–519; Morss, 1931, pp. 28–29; Thomas, 1932 and 1935; Malcolm, 1939; Hill, 1938.

[19] Cf. Colton, 1920; Morss, 1931, pp. 14–15, 16–17; Reagan, 1933; Tanner, 1936.

and punitive forays launched from temporary camps in the hills.[20]

Limited excavation at sites on the Uncompahgre Plateau in 1940 indicated a comparatively brief occupation of the individual house ring. Hearths, when present, are simple basin-shaped excavations in the center, and usually only a shallow fill has accumulated. Doors, when present, are to the east (one exception, southwest). Roof evidence is still unsatisfactory but a light conical roof (a lean-to conic section in the case of the house built against a ledge or rock) covered with skins, brush, or mats, is suggested.[21]

In clearing these ruins, several thin sandstone slabs of diameters greater than the thickness of the walls have been encountered leaning against the walls from the outside. To reach their present positions they must have tumbled from the wall, yet their offsize indicates some distinct use. The size and position of the stones may be explained if we assume a steeply conical roof held in place on top of the walls by the leaning of slabs against the bases of the pole rafters. When such a roof collapses, whether from burning or gradual decay, the descending rafter poles act as levers tending to kick the slabs off the walls to the outside, provided the poles originally stand at a fairly high angle. However, if the rafters slant inward at an angle much lower than 45 degrees the slabs certainly will fall inside the walls. The use of sandstone slabs laid over rafters, a non-Puebloan trait, has been reported by Jeançon[22] in the Moffat County caves associated with a Basketmaker-like masonry; by Morss,[23] from a Fremont River Cave; by Reagan[24] in the Uintah region of northeastern Utah; by Hibben[25] in the Gallina region of New Mexico; and by Steward[26] for the modern Spring Valley Shoshoni.[27]

[20] Estimate based on Thomas, 1932, and 1935; Hill, 1936, p. 6; 1940, p. 398. A "tower" is mentioned for the Jicarilla Apache, but with the specific statement that the building was used as a house (Thomas, 1935, p. 115). After nightfall, a besieged house was abandoned and the occupants fled to the hills (Palomas Apaches of the South Platte, Thomas, 1935, p. 132). The Sierra Blanca Apache, now part of the Jicarilla, left their houses at night and retired to the hills to insure their lives (Thomas, 1935, p. 142). The Navaho, 1712–1715, lived in the valleys except when hard-pressed by the Ute, then they lived on the mesas (Hill, 1940, p. 411).

[21] Huscher and Huscher, 1939 and 1940.

[22] 1927, p. 26 and Fig. III, No. 1. [23] 1931, p. 19.

[24] 1933, p. 5. [25] 1938, p. 134. [26] 1941, p. 334, Trait 636.

[27] Some of Renaud's (1931) slabs standing on end might be traced to a similar house-roof construction or they may represent remnants of the slab-faced earth walls described by Moorehead (1921, and 1931). Cf. Morss, 1931, p. 17, for leaning slabs. Ulibarri (1706) found the pagan Cuartelejo Apache greatly impressed with the efficacy of the cross as a protective talisman and noted that they had set up large crosses near their villages (Thomas, 1935, p. 68 et seq.); the centrally located monoliths mentioned by Renaud for the Apishapa sites may be remains of such crosses. Certainly there is no need to postulate a sun-worship cult.

Charcoal traces on the floors, and oxidized areas on the inner wall surfaces at several ruins, suggest final destruction of the roofs by fire. Recovered charcoal has been highly fragmentary, indicating only that small-diameter juniper poles had been used. No heavy timbered roof covered with earth or adobe is admissible since no smothered charcoal or burned clay casts have turned up and there is little evidence of fill in the individual house rings.

At all our sites the projectile point is small, arrowhead size, and invariably made from a leaf shaped blank by notching rather deeply from the corners, the base left with its original convex outline; thus, the points are stemmed, with convex base, and with various degrees of barb development.[28] In past years, literally thousands of tiny stemmed and barbed bird points have turned up from the sand dune blowouts of the San Luis Valley, but the point type now is definitely known to be associated with the circular stone house sites.

One class of knife is pressure-flaked and corner-notched, simply a larger edition of the point.[29] More numerous, however, are coarse percussion-flaked choppers, flake knives and scrapers with little or no retouch.[30] Hafted axes and mauls are entirely missing but the small fist-sized hammerstone, usually in quartzite or mudstone, is very common. The one-hand mano and utilized slab metate, or deep oval bowl metate, are present (particularly Uncompahgre Plateau) but scarce.

Pottery is disappointingly rare at all the circular stone house sites we have examined. In the San Luis Valley the associated pottery form is a coarse, poorly smoothed black ware, an occasional sherd burned to a red-bronze on the exterior, fine sand or ground rock temper, little or no mica, shapes not known. In west central Colorado, only a few sherds of black-on-white and plain and corrugated gray are known definitely

[28] Another cultural index distinguishing the sites from late Ute camps. Identified Ute projectile points from our area are pressure-flaked from straight-sided isosceles triangle blanks, notched from both sides or both sides and the base. This agrees with Steward's findings for the Great Salt Lake area (Steward, 1936, Figs. 11, 2) and strengthens the view that the Shoshoneans have arrived recently from the west.

[29] A single corner-tanged knife, made of a local material, was found in the midden of a hogan-type ruin in Mesa County. Should the distinctive corner-tanged knife prove to be a trait of the northern complex, a convincing continuity can be shown. A typological relationship with the Eskimo skinning knife is obvious; comparable back-hafted knives, coarse black pottery, and circular pit-houses are known from prehistoric horizons in Japan (Patterson, 1936; Mantz, 1939). Incidentally, there is some evidence that certain Eskimo groups are recent migrants to the Arctic coast from the Canadian interior, present home of the Northern Athapaskans (Shapiro, 1931), and Jenness (1938) has estimated that the ancestral Athapaskans probably were crossing from the Asiatic mainland as recently as 1000 B.C.

[30] Gifford's trait list (1940) emphasizes percussion-flaking for Southern Athapascans.

to occur with the hogan-type rings. Certain shelter sites are known, however, which are reported to have yielded sherds of a coarse black utility ware, in one case with crude corrugations and a pointed bottom.[21] Incomplete reports indicate that a similar condition exists in northeastern Utah, various types of dry-laid and adobe-laid buildings being found associated with Pueblo sherds and black utility wares.

In the above-mentioned areas, the Pueblo sherds are of random types which could only mean casual trade contact. The black utility ware remains the only type which could actually have been made locally to any extent on the Northern Periphery.

Steward concluded[22] that the bison hunters of the Great Salt Lake caves had probably brought a coarse black pottery with them from the north and east. We can hardly suppose, however, that the Promontory people were the only such northern band to enter the Great Basin-Colorado drainage, or that their pottery is the only non-Pueblo type to appear on the Northern Periphery in late Pueblo times. Our present evidence, admittedly defective, suggests that several related bands may have entered the Green River-Uintah area from the north, perhaps at slightly different times. Most of these bands drifted on south, but one group penetrated as far west as the Great Salt Lake area, leaving the now-famous Promontory Cave remains.

The full implications of the Promontory type of pottery have not been sufficiently stressed: this type gives archaeological perspective to the otherwise puzzling surface distribution of a coarse, sand or pebble tempered pottery west and south of the Rocky Mountains. Our find at an old surface camp[23] of parts of four pots in a Promontory-like paste, including one partially restorable pot with a thickened rim and a thickened pointed bottom, adds the missing trait form for our area. Relative age has been established elsewhere[24] and, with form known, we are now justified in asking whether this distinctive ware may not lie near the

[21] Huscher and Huscher, field notes.

[22] 1937*a*.

[23] Site, located in 1940 in Mesa County, Colorado, had no masonry or surviving wood. Traits associated at this site: coarse paste, burning dark drab to red-buff; coarse sand temper (up to 9 mm.) showing both faces; organic inclusions, whether from carelessness or intention; sherd thicknesses around 6 mm., rims somewhat greater; thickened (14 mm. plus) pointed bottom; approximate diameters, 20–30 cm.; vertical curve less than horizontal in one case, indicating a tall shape. Circuit building is certain, rounds added by pressing onto the last round from the inside, each round adding approximately 30 mm. to the height. One rim strengthened by addition on the inside of a final coil smoothed at the top but not pressed into the pot at the lower edge. Fingernail incising present on surface of one pot, while another has a peculiar dimpled surface (Cf. pitted Fremont ware, Morss, 1931, p. 45). The dimpling did not depress the sand temper or puddle the clay, however.

[24] Steward, 1936, p. 62; Smith, E. R., 1940, p. 344.

ancestral line from which not only the Apache-Navaho and Ute-Paiute utility wares, but also the entire family of Lower Colorado River utility wares, have sprung.[35] The McKern hypothesis of an Asiatic origin for the Eastern Woodland pointed-bottom pottery[36] then might legitimately be expanded to include eastern and western branches of a single ceramic family, ultimately from Asia, with Athapaskans as probable primary agents in its dispersal.[37]

Pottery shapes described by Sapir,[38] Gayton,[39] Schellbach,[40] Steward,[41] de Laguna,[42] and, possibly, Ray[43] and Lowie,[44] imply a more recent diffusion, by approximately the same routes, of a cruder, bucket-shaped pot, characteristically tempered with animal fibers and often bailed. However, Sapir[45] makes a good case for the older ceramic continuity by tracing the Navaho name for a pottery olla, *asa*, through the northern Athapaskan tribes; thus, Sarcee, *asaa*, Carrier, *onsa*, etc., only Tena differing.[46] Sapir mentions[47] Sarcee use of a whitish stone (limestone?) burned to a powder then apparently mixed with the clay. Some Promontory-like sherds from western Colorado and eastern Utah have been tempered with a stone which calcines (during firing?), the calx subsequently leaching out leaving matrix holes.[48] Among the historic Arikara[49] fire-cracked sweat-lodge boulders of granite were crushed to provide temper. Deliberate selection of the prominent quartz pebbles in Promontory ware might very well have had a similar origin.

The peculiar Fremont type of moccasin[50] occurs in an east-west distribution from Colorado[51] through Utah[52] and into Nevada,[53] closely

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[35] An intriguing technological similarity, hardly coincidence, is the use of salt-lick clay, salt water for mixing, or some sort of doctoring of the mixing water (antlers, weeds, vegetal juices) noted in the manufacture of Navaho pipes (Tschopik, 1941, p. 57), Ute utility ware (Barber, 1876), Lower Colorado utility ware (Rogers, 1936), and Paiute cooking pots (Steward, 1933, pp. 266–267). [36] McKern, 1937.

[37] Such occurrences as the Largo and Gallina Woodland utility wares (Hibben, 1938; Mera, 1938) could as well be regarded as an eastern extension of the supposed western type as the reverse.

[38] 1923, p. 251. Cf. Curtis, 1928, p. 101. [39] 1929, p. 247. [40] 1930, p. 123.

[41] 1933, p. 267 and 1941, p. 340, Fig. 11. [42] 1936, p. 338.

[43] 1932, pp. 127–134. [44] 1909, p. 117. [45] 1923, p. 253.

[46] See also Sapir, 1936, though implying a continuity via the Plains rather than the Intermontane region. [47] Sapir, 1923, p. 249.

[48] Huscher and Huscher, field notes. Cf. E. T. Hall, quoted in Renaud (1937, p. 15): surface sherds from the High Plans with " . . . Large irregular temper which dissolved away, leaving holes." The Utes used ground "marl" in making their pottery (Barber, 1876, p. 452). [49] Gilmore, 1925, p. 286. [50] Morss, 1931.

[51] Huscher and Huscher, field notes from San Miguel County: pucker string tie, dew claws back of heel rather than under.

[52] Reagan, 1933, p. 7; Steward, 1937*a*, p. 69, Fig. 23*k*.

[53] Wheeler, 1938.

agreeing with the distribution of the Promontory type of pottery as now known. On the other hand, the elaborate Fremont type of katchina petroglyph,[54] named for a site in southern Utah but most highly developed in northeastern Utah,[55] seems to be absent in western Colorado[56] and western Utah, but may be related to examples known in northwestern Wyoming. These distributions of pottery, moccasins, and petroglyphs are intelligible if we regard them as traits of the northern hunting culture brought down by several related bands entering eastern Utah and western Colorado from the north.[57]

Summarizing, we feel that the present evidence, to which our own contribution has been scant, justifies the hypothesis that a considerable part of the Southern Athapaskan migration was via the Intermontane region and adjacent Rocky Mountain foothills to the east (but still west of the Continental Divide); that the ancestral Athapaskan bands brought from the north a simple hunting culture and a circular or at least curvilinear stone house often built in prominent locations, subsequently diffused to some neighboring groups; that their archaeological remains will be distinguished by emphasis on percussion flaking, lack of the stone ax or maul, lack of specialized mano-metate forms, use of a coarse sand or pebble tempered pointed-bottomed pottery, use at some sites of a distinctive and archaeologically identifiable roof-construction, use of a distinctive petroglyph style; and that sites showing various degrees of intergradation with Pueblo should be expected from widely scattered points on the Northern Periphery, dating from early Pueblo times at least to the end of the Classical period.

The combination of the Steward and McKern hypotheses as outlined here is based on selected evidence, for which we need offer no apology. Paraphrasing the words of a now outmoded philosopher, "Not the least of the charms of a theory is that it may be refuted." Nevertheless, we feel that the hypothesis does offer reasonable explantions for some of the puzzling points of Northern Periphery archaeology and presents fewer contradictions than any of the alternatives.

Colorado Museum of Natural History
Denver, Colorado
August, 1941

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[54] Morss, 1931, Pls. 13–16; Reagan, 1935, p. 81. Cf. Kidder and Guernsey, 1919, Fig. 102. [55] Steward, 1937*b*.

[56] Possible exceptions: Yampa Canyon (Morris, Glazier and Thallon, 1937) and Dolores River drainage (Huscher and Huscher, field notes).

[57] Judd (1941, p. 429) points out that distributions of culture complexes in Utah tend to extend north and south, rather than east and west.

EIGHTEENTH CENTURY NAVAHO HOGANS FROM CANYON DE CHELLY NATIONAL MONUMENT

WESLEY R. HURT, JR.

ARCHAEOLOGICAL reconnaissance during the summer of 1941 at Canyon de Chelly National Monument disclosed the location of two groups of Navaho hogans built in 1758, 1766, and 1770.[1] The significance of these dwellings lies in the fact that they definitely establish Navaho occupation of the area west of the Chuska Mountains in the middle of the eighteenth century. In addition to the early dates and the architectural details, the sites produced a large series of Navaho painted sherds and several glass trade beads.

Canyon de Chelly is located in the approximate center of the Navaho Reservation, on the west side of the Defiance Plateau, in northeastern Arizona. The first group of hogans, the Spider Rock hogans, lay at a distance of 2.7 miles from the Chinle-Defiance road, along the small spur going to the Spider Rock Overlook; the second group was situated further along this by-road at a distance of 3.3 miles from the road. The first site included three conical hogans, a sweat house, and several areas of refuse; the second contained a six-sided,[2] a conical and a possible square hogan. Associated with the first hogan group was a small Developmental Pueblo ruin, located at a distance of some 150 feet to the northwest, while .3 of a mile further north on the road was another small pueblo ruin. Near the latter was another sweat house that did not appear to be very old, since the dirt covering was still present. Surrounding the old hogans was a thick pinyon-juniper forest associated with sage and rabbitbrush.

In the first group of hogans, all of which dated 1758, one structure, No. 1, was still standing, giving a good impression of the type of house construction during that period. It was of the "pile stick" or conical hogan type, called *xòyan? alci? adezí?* by the Navahos. Three interlocked poles, oriented north, south, and west, were used as the main building supports, and on top of them to the east was placed the two

[1] Harold S. Gladwin, personal communication August 17, 1941. I wish to express my great appreciation to Charles D. Wyatt, Custodian of Canyon de Chelly National Monument, for the opportunity to investigate the hogan sites; to Harold S. Gladwin and Deric Nusbaum of Gila Pueblo for dating the wood specimens; to A. Wetmore, C. W. Gilmore, and Kellog of the United States National Museum for identifying the bones; to Arthur Woodward of the Los Angeles Museum for identifying the beads; to Leland C. Wyman for visiting and checking the sites; and to Richard Van Valkenburgh for his valuable suggestions.

[2] This hogan had only five wooden sides, but if the doorway is considered as another side, it would be classified as a six-sided hogan.

door poles. The method of supporting the door lintels is a matter of conjecture; all wood of this type had fallen away. In the interior of the hogan, two large stones[3] were to the sides of the door, while by the north post stood a short, thick log. Over the tripod support and door posts was laid a covering of juniper and pinyon poles which had been cut by means of an ax and stripped of bark. A few of the poles also had roughly-hewn sides. The presence of several large logs in front of the door probably indicated that an antechamber had been present. The floor was excavated to a depth of about a foot, forming a pit.[4] Some two feet from the door, in the midline of the hogan, was a shallow basin, six inches at its greatest depth and two feet four inches in diameter, filled with white ash and undoubtedly the fireplace.[5] No other features were found in the interior, even the conventional dirt bank and mealing bins being absent.[6] One Navaho polychrome sherd and a few animal bones were the only artifacts uncovered in the room debris. The hogan measured 46 feet in circumference, 13 feet in north-south diameter, 16 feet east-west, and stood five feet ten inches on the inside and six feet five inches on the outside. The door at the base was two feet wide. (Pl. III, facing p. 104.)

Thirty-five feet to the north lay a fallen structure, of the conical type, which differed from Hogan No. 1 in that it had four large rocks placed by the north door post and three by the south door post instead of only one at each side. This hogan, No. 2, measured 44 feet in circumference, 15 feet long (east-west), and 13 feet wide (north-south). At the time of the investigation, the structure stood only three feet high. Adjacent on the east was another fallen conical hogan, No. 3. Since the poles of the latter dwelling were widely scattered, it was impossible to make an accurate estimate of its size. All in all, the logs covered an area measuring 25 feet north-south and 31 feet east-west. The floor was excavated to the depth of one and one-half feet. It was noticeable that all the hogans described in this paper were longer east-west than north-south.

Ninety-one feet to the southwest of No. 1, was a large circular refuse area that measured four feet four inches in width (east-west) and 14 feet in length (north-south). The surface of the debris lay flush with the

[3] This feature was noted by Keur in the forked-stick hogans of Big Bead Mesa (1941, p. 21).

[4] The Tipi type of hogan described by Page (1937*b*, Pl. IV) showed the presence of pit floor.

[5] The presence of a fire pit off center toward the doorway was noted by V. Mindeleff (1898, p. 493) and Keur (1941, p. 31).

[6] Van Valkenburgh mentions the mealing bins as being a common feature in the Dinexta forked stick hogans (1941, p. 9). Keur notes the presence of the bins in the hogan ruins of Big Bead Mesa (1941, p. 34).

gound level and was bare of vegetation. It was comprised of from three to ten inches of unstratified animal bones, charcoal, burnt stones, ash, broken manos, squash seeds, flint chips, and painted and plain sherds. Judging from the contents, the area was a place where kitchen refuse was dumped; no posts or post holes were found to indicate that the area was a summer shelter. Along the east side of the hogans was another series of refuse areas on which were found many sherds. Some 200 feet northeast of Hogan No. 1, in the heavy forest, stood a small sweat house, three feet high, 21 feet in circumference, six feet north-south, and seven feet east-west. The inside had been filled with charcoal to a depth that made entrance impossible. Wyman suggests that the ash may have been deposited in the sweat house as a part of a ceremony.[7] On the north and east sides of this structure were large piles of burnt sandstone. In a line to the northeast of Hogan No. 3, at distances of 24 and 114 feet, were two piles of pure ash which, according to Wyman, may represent some of the ceremonial ash deposits.

The second group of Spider Rock hogans lay six-tenths of a mile to the north of the first hogan and along the same road. In this series, structure No. 4, dated 1766, was a fallen conical hogan larger than Nos. 1–3: 63 feet in circumference, 21 feet east-west, and 18 feet north-south. The main supporting timbers of this hogan were roughly hewn. Several broken manos and the tip of a rusted iron scythe were found near this dwelling. A few feet to the southeast was an ash pile in which were uncovered many animal bones and sherds of plain utility ware, painted pottery being absent.

Twenty feet on the other side of the road, to the west, were the foundational logs of a six-sided hogan, dated 1770. It was made of logs, laid one on top of the other, and covered with what might formerly have been a cribbed roof, although no roofing timbers were present. The door was one foot 10 inches wide and each of the side walls measured approximately nine feet long. The former feature was on the east side, as were the doors of all the Spider Rock hogans. The floor was excavated to the depth of about a foot.

Thirty feet to the north of Hogan No. 4 was a u-shaped structure comprised of five large logs, covering an area approximately 18 feet east-west and 10 feet north-south, with the south side open. Since two of the timbers were superimposed upon two other logs, the structure gave the appearance of having been the base of a four-sided hogan. The wood was so badly rotted that no dates were obtained from this structure, but its association with the other two hogans established its erection between the years 1766 and 1770.

[7] Leland C. Wyman, personal communication, August 24, 1941.

One arrowpoint was represented in the series of artifacts found at the refuse area to the southwest of the first hogan group. It had a corner-notched base and fine chipping, and measured 28 mm long, 2 mm wide, and 3 mm thick. It is possible that the arrow point was not of Navaho make, but had been picked up at the nearby Developmental Pueblo ruin and reutilized. One hundred and seventy-eight sherds were also found in this area. They were arbitrarily classified as: (1) Polychrome, 49 sherds from one restorable vessel, 17 sherds from another bowl, and two pieces from a third vessel; (2) Reddish-Brown-on-Buff, seven sherds from one bowl, two from another, and three miscellaneous sherds; (3) Painted Ware with Decoration lacking, 11 sherds; (4) Black Utility Ware, 98 sherds; and (5) one sherd resembling Jeddito Black on Yellow.[8] The other refuse areas near the first hogan group also produced a series of painted and plain utility sherds of the same types mentioned above. At the second hogan group, only the plain utility wares were found.

The painted sherds were all of the same basic type, with two main subdivisions, polychrome and reddish-brown-on-buff. The paste is not homogeneous, has rough fracture, is hard, and varies in color from gray, red, orange, buff, to brown. Crushed sherds, very large in some of the examples, were used as temper. Walls varied from 3 to 6 mm. The exterior was scraped with corncobs, the marks of which were apparent on many of the specimens. On the surface of a few were pits caused by the temper falling out during the process of scraping, while other vessels had a smoothed surface with firing clouds present. The interior surface was smoothed but not highly polished, no slip on most specimens, color varying from buff, red, brown, orange, or gray. Rims were rounded, squared, or slightly lipped. Deep and shallow bowls were present. All pieces were coiled and there were two types of design, the polychrome and the monochrome. The two-toned type consisted of a reddish-brown design outlined by a brown border line on some examples, and, on others, simply distinct figures of these two colors; the monochrome type usually had reddish-brown figures. On the top and exterior of the rim was an encircling band, while on the interior the band was broken in one place. On the interior base of the bowl was usually a complete design element of checkerboards, stars, and triangles from which might radiate pointed figures. Triangles and stepped elements were often suspended from the rim bands. Only geometric rectilinear figures were represented.[9]

[8] Twenty-two sherds found at the Big Bead Mesa hogans are described as Hopi-like ware by Keur (1941, p. 50).

[9] The occurrence of life designs on Navaho painted pottery was noted by the Franciscan Fathers (1910, p. 286). Tschopik illustrates many modern painted pots with life designs (1941, Pls. XII, XIII, XIV).

Several examples of Navaho painted ware have been found in other localities in the Canyon de Chelly area.[10] The writer picked up painted sherds on the rim near Three Turkey House, by the Antelope Point Overlook, and on a Pueblo ruin in Canyon del Muerto. The plain utility ware was plentiful in the refuse areas of many of the ruined hogans of the de Chelly area, both ancient and modern. This type of pottery was not easily distinguished from that made by the Navahos in other parts of the Reservation.[11] Only in the matter of form and decoration might the de Chelly utility ware be divided into sub-types. The pots varied in shape, from a squat vessel with a rounded bottom to a tall variety with an almost conical base. Near the rim of many of these vessels was a meandering fillet with diagonal or circular incisions, while on others only the incisions were present. A few of the utility vessels lacked any form of decoration.

To gain additional information on Navaho painted pottery, the writer had an old Indian woman in Canyon de Chelly make five vessels. She was the only woman in the area who could still make the pottery, having learned the art from her mother, who in turn learned it from the grandmother.[12] Questioned as to the source of the art, she said her grandmother had told her that the Navahos derived the idea of making painted pottery from the sherds found on the Anasazi ruins.[13] Although she did not regularly make painted pottery, she was glad to do so for remuneration. Several of the de Chelly informants stated that it was not their custom to make over three pots a year; but this fact did not seem to perturb the squaw. Furthermore, she stated that she had made as many as nine of the cooking pots at one time. She stated that the only regular use for the painted pottery at the time was in certain ceremonies performed by the *xata'li*, or medicine man.[14] At the time the writer ordered the pottery, one of the *xata'li* took advantage of the opportunity and had a vessel made. The Navaho woman did not permit anyone to watch her make the pottery, holding to the superstition that unless the vessels were made in secret they would fall apart during the process of

[10] The description of the three Navaho Polychrome sherds found at Big Bead Mesa (Keur, 1941, p. 48) agree on the whole with those at Spider Rock.

[11] The utility ware described by Hill (1937, pp. 11–17) and Keur (1941, pp. 46–47) agrees in the main details with that of the Spider Rock hogans.

[12] Tschopik states that the grandmother was more often the teacher (1941, p. 46).

[13] This statement is not in accordance with the more logical hypothesis that the germ of the Navaho painted pottery was derived from the historic Pueblo wares. The fact that Malcolm (1939, pp. 13–15) and Keur (1941, pp. 48–50) found many sherds of historic Pueblo ware lends support to the latter suggestion.

[14] Hill notes the use of painted Navaho bowls as medicine containers in some of the ceremonies (1937, p. 9).

firing.[15] Accordingly, she retired to a secret locality on a mesa top, where sheep manure and firewood were available.

The clay was obtained for her south of Antelope Point Overlook, at a place where she declared the only suitable material in the de Chelly area was to be found. According to James N. Spuhler, who accompanied her son, Tule Bia, when he gathered the clay, no ritual was performed. The hole was covered when the work was finished. Mr. Bia and his mother explained the technique of pottery making in this manner: the clay, a hard blue variety, is placed in water and soaked until it is soft, when it is stirred, thoroughly mixed, and freed of lumps. Potsherds are then ground to bits on a stone and mixed with the clay.[16] When the mixture is of the right consistency, a small lump is molded by hand, forming the bottom of the vessel. Another bit of clay is then rolled into a sort of rope on a flat rock. This clay rope is attached to the basal portion and wound around and around until the vessel is formed. The roll is then pinched together and smoothed on the inside with a section of gourd, while the outer surface is scraped with a corncob until fairly smooth. When this work is completed, the vessel is placed in the sun and allowed to dry for about a day. The following morning, a green twig with a frayed end is used as a brush to apply the paint. For the reddish-brown paint, the dark core of a hematite concretion is ground to a powder on a stone. Then resin is placed in a pan, and melted over heat, when the pulverized mineral is stirred in. The paint is applied to the vessel while still warm. After the bowl is painted, it is placed in a smouldering, sheep manure fire where it is left until thoroughly baked. The pottery maker stated also that hot resin is applied on the utility ware after firing to prevent cracking.[17] Furthermore, she said, the application of resin and the lack of painted designs constitute the only major difference in the making of utility and painted wares.

The five vessels in the writer's possession are similar in appearance to those found in the ancient hogan sites. Four of them are deep bowls and the other is a spoon shaped like an open gourd dipper.[18] The designs are of two-toned reddish-brown figures applied on an orange-buff

[15] At Ramah one informant stated that it was all right for people to observe the grinding of the clay but not the actual construction of the vessels. Tschopik, 1941, p. 49

[16] Van Valkenburgh, who observed the pottery maker gathering sherds, stated that she gathered only undecorated ones, personal communication, September 3, 1941.

[17] This differs from the description given by the Franciscan Fathers, who state that the gum is placed on the pot before firing (1910, p. 288).

[18] The de Chelly potter stated that the spoon was used for eating. Among the Ramah Navaho the half-gourd-shaped vessel was used for drinking soup, water, boiled milk (Tschopik, 1941). The Franciscan Fathers mention that the earthen spoons and dippers were used for the purpose of dipping out liquids (1910, p. 286).

background. Firing clouds are present, a characteristic common to the Spider Rock painted wares. Two major differences between the new and the old wares are the presence of life designs and a more brilliant paint on the former. Several conventionalized corn plants are represented among the design elements on the new pottery. The designs in other respects, such as the break in the rim band, the utilization of triangles,

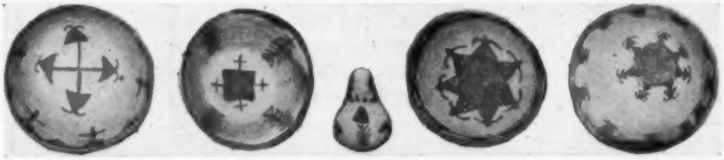

FIG. 6.—Modern Navaho pottery from Canyon de Chelly.

and the central figures at the base, were similar to those found on the Spider Rock painted wares. The modern painted pottery of the de Chelly area was very well made but the designs were rather poorly executed.

Although the painted pottery from Canyon de Chelly resembled that of the Ramah area, there were also many differences both in the technique of construction and the final product. A few traits common to both regions were the following: (1) utilization of sherd temper, although Tschopik states there is no marked preference in the Ramah area;[19] (2) use of sheep manure for firing; (3) use of gourd and corncobs for scraping the vessels; (4) presence of firing clouds on the pottery; (5) application of design before firing;[20] (6) occurrence of life and geometric designs; and (7) the belief that the pottery will break during the process of firing if observed by an outsider. A few points of difference in the Ramah pottery complex were the following: (1) clay ground on stone; (2) use of Yucca juice for paint, also the utilization of cannel coal mixed with resin for black paint; (3) application of slip to the pots; (4) utilization of yucca for the paint brush; and (5) use of stone polishing tools.[21]

Three types of manos were associated with the Spider Rock hogan sites. One variety had a flat bottom, beveled top, and rectangular shape with rounded corners.[22] Although the top surface was beveled, this type

[19] Tschopik, 1941, p. 19.

[20] Tschopik also notes the occurrence of painting the vessels after firing (*Ibid.*, p. 10).

[21] The description of the Ramah pottery complex is from Tschopik, 1941.

[22] This type is represented at the Navaho sites on Big Bead Mesa (Keur, 1941, Fig. 5, No. 1).

of mano was not very thick. Examples of the second group, however, were very thick, and had rounded corners, rectangular shape with flat bottom, and convex top. The last type had a flat bottom and top, and a rectangular form with rounded corners.[23] The majority of the manos were made of sandstone and may have been found at the nearby Developmental Pueblo ruin by the Navahos and re-utilized. One mano of the latter type was made of lava, a type of stone not observed in the de Chelly Pueblo ruins by the writer. Because of this fact, it has been classified as a Navaho-made mano.

Glass beads from the main refuse area of the Spider Rock hogans included two types: a minute globular shape, in white, blue, or green; and a cylindrical form colored black or pink on red. According to Woodward,[24] the beads were of a generic type that might be as old as 1758 or as late as, or later than, 1860. The mono-colored seed beads had been made in the form found at the Spider Rock sites for two or three hundred years. "The small red ones with the light pinkish exterior are of a type known as the Cornaline d'Allepo. They vary in size from tiny round ones . . . to large cylindrical beads. The exterior may be either a dull opaque brownish red or a translucent bright red. The interior ranges from white through pink and pale yellow. As a rule, the opaque reddish brown beads are older. The seventeenth and eighteenth century beads are usually this color. Late eighteenth century on through the nineteenth have the translucent red exterior. . . . Practically all of the beads of this type came from Murano, near Venice."[25] While it is not possible to state that the beads were definitely associated with the Spider Rock hogan sites, they gave every appearance of having been so associated.

Animal bones from the refuse areas near Hogan Group 1 included, according to Gilmore, modern horse (*Equus caballus*) represented by one upper cheek tooth and a few bone fragments; and modern deer (*Odocoileus hemionus?*) represented by skull and jaw parts, vertebrae ribs and numerous fragments. Those from the refuse areas by Hogan Group 2 included modern horse, represented by upper and lower teeth, fragments of skull, and sesamoid; and modern deer (Kellog says probably *Odocoileus hemionus*) represented by a portion of the right ramus with four teeth. It was from an aged individual. There were also a few undetermined fragments, probably deer.[26] In view of the fact that Rabal

[23] This mano is similar in appearance to another found at Big Bead Mesa (*ibid.*, Fig. 5, No. 2).

[24] Arthur Woodward, personal communication, September 24, 1941.

[25] *Ibid.*

[26] A. Wetmore and C. W. Gilmore, personal communications, September 11 and 12, 1941.

mentions the occurrence of sheep and goats among the Navahos as early as 1744[27] and Keur reports sheep bones from the Big Bead Mesa sites,[28] it is noteworthy that only deer and horse bones were found in the Spider Rock hogans.

The date, 1758, places the construction of the Spider Rock hogans near the middle of Navaho occupation in the Southwest. Matthews estimates that the Navahos entered the area "between 500 and 700 years ago," and Hodge places the year at 1485,[29] though no archaeological evidence as yet confirms these early dates. The *Relaciones* of Father Geronimo Zarate-Salmeron, a history of Spanish activities between 1538 and 1629, places the Navahos in the *dinétah* area as early as 1600.[30] Van Valkenburgh states that according to tree-ring dates, the Navaho were in this area, the northwestern portion of New Mexico, between 1715 and 1768.[31]

The first record of the Navaho penetration west of the Chuska Mountains is in a letter written by Governor Francisco Cuervo y Valdes at Santa Fe, on August 18, 1706, immediately after his campaign against the Navahos during that year.[32] He describes the province of the Navahos as "100 leagues north to south, on the north to the boundaries of the Yutas, Carlans, and Comanches, and 300 leagues from east to west, the boundary running through the Tewa and Keres and Jemez, Laguna, and Acoma, El Morro and Zuni, and the Hopi towns."[33] If the Navaho were present as far west as the Hopi villages, it is probable that they had penetrated Canyons de Chelly and del Muerto by that time.

The Cuervo y Valdes document and the date of 1758 from the Spider Rock hogans thus places the Navahos in Canyon de Chelly before they left the *dinétah* area. It is noticeable that the year 1758 is the year of the last tree-ring date of Navaho occupation in Largo Canyon, a part of the *dinétah* area.[34] The eighteenth century occupation of Canyon de Chelly is further confirmed by the map of Father Anastasio Dominquez and Silvestre Escalante, who made a tour or exploration from Santa Fe to Utah Lake in 1776.[35] Their map shows that the western boundary of the Navaho extended to the Chinle Valley, which runs at right angles to the mouth of Canyon de Chelly. At approximately the same time the Navaho were migrating westward from the *dinétah* area to Canyon de Chelly, they were also moving southward into the area of the Big Bead Mesa. Keur estimates that they had entered the latter area by 1750.[36]

Judging from archaeological evidence, the de Chelly Navahos, as

[27] Hill, 1940, p. 397. [28] Keur, 1941, p. 46. [29] Hodge, 1895, p. 223.
[30] Amsden, 1934, p. 127 [31] Van Valkenburgh, 1941*b*, p. 9.
[32] Reed, 1941, p. 486, quoted from Hackett, 1937, pp. 381–383.
[33] *Ibid.*, p. 497. [34] Van Valkenburgh, 1941*b*, p. 9.
[35] Amsden, 1934, Pl. 57A. [36] Keur, 1941, p. 2.

represented at the Spider Rock sites, were intimately related to the broad pattern of culture found in the *dinétah* and the Big Bead Mesa areas. The presence of forked stick hogans, Navaho painted wares, Navaho utility wares, sweat houses, ash dumps, etc., indicated their common centers of origin. Because of the lack of published material on the *dinétah* area, it is not possible as yet to state the differences in cultural traits between the Spider Rock and the *dinétah* area. It was noteworthy, however, that Gobernador Polychrome, a ware characteristic of the *dinétah* area, was not found in the Spider Rock sites. The latter differs also from the Big Bead Mesa sites in that it lacks stone fortifications and stone hogans,[37] mealing bins, historic Pueblo wares (with one exception), Gobernador Polychrome, and sheep bones.

SUMMARY

Near the Spider Rock Overlook in Canyon de Chelly, three groups of Navaho hogans, dated 1758, 1766, and 1770 respectively, were found during the summer of 1941. These dates confirm the Navaho occupation of Canyon de Chelly in the middle of the eighteenth century. With the exception of a six-sided hogan, and a possible four-sided one, the other structures were of the common forked stick type found in early Navaho sites.

The art of making painted pottery has continued in Canyon de Chelly from the time of the Spider Rock hogans until the present. Furthermore, the modern Navaho painted pottery is similar in many details to that in the ancient sites of the area. Although the de Chelly painted pottery is different in many respects from that of the Ramah area, its many similarities suggest a common point of origin.

The presence of glass beads at the Spider Rock hogans indicates trade relations with the Spanish. With the exception of the beads, and the tip of a rusted scythe (found on the surface), objects of European manufacture were absent.

Both horse and mule deer bones were found, while sheep and goat bones were noticeably absent.

The occupation of the Spider Rock hogans coincides with the occupation of the Big Bead sites and the abandonment of the *dinétah* area. Judging from archaeological evidence, the culture represented at the

[37] Page mentions, however: "In a personal interview, Mr. Haske Naswood, of the Soil Conservation Service, says the hogans in use in Canyon de Chelly prior to the exile of the Navajos to Fort Sumner in 1863, were semi-pit structures. A pit one or two feet deep was excavated; then low walls of undressed stone were built around the edges, on the top, and the whole was capped with roof beams laid in parallel formation, or was cribbed" (1937*b*, p. 47).

Spider Rock sites was intimately related to the broad pattern of Navaho culture in the *dinêtah* and Big Bead Mesa areas, although it differed in several details.

University of New Mexico
Albuquerque, New Mexico
November, 1941

A BIBLIOGRAPHY FOR NOMADS OF THE SOUTHWEST FOR THE THREE PRECEDING ARTICLES

AMSDEN, C. A.
1934. *Navajo Weaving: its Technique and History.* Santa Ana, California.

Anonymous
1923. "Ancient Spanish Torreon at Manzano." *El Palacio*, Vol. 14, No. 9, p. 126.
1925. "Spanish Torreon at Manzano." *El Palacio*, Vol. 19, No. 8, Front Cover.

BANDELIER, A. F.
1892. *Final Report of Investigations among the Indians of the Southwestern United States, carried on mainly in the years from 1880–1885.* Papers of the Archaeological Institute of America, American Series 3–4, No. 4. Cambridge.

BARBER, EDWIN A.
1876. "The Ancient Pottery of Colorado, Utah, Arizona, and New Mexico." *American Naturalist*, Vol. 10, No. 452.

BLOOM, L. B., and L. B. MITCHELL
1938. "The Chapter Elections of 1672." *New Mexico Historical Review*, Vol. 13, No. 1, p. 107.

CHAPIN, F. H.
1892. *Land of the Cliff Dwellers.* Boston.

COLTON, H. S.
1920. "Did the So-called Cliff Dwellers of Central Arizona also build Hogans?" *American Anthropologist*, Vol. 22, No. 3.

CURTIS, E. S.
1928. *The North American Indian*, Vol. 18.

DOUGLAS, F. H.
1937. "Seven Navajo Pots." *Denver Art Museum, Material Culture Notes*, No. 3, pp. 9–14.

FARMER, MALCOLM
1941. "The Growth of Navajo Culture." *The San Diego Museum Bulletin*, Vol. 6, No. 1, pp. 8–16.

FEWKES, J. W.
1919. *Prehistoric Villages, Castles, and Towers of Southwestern Colorado.* Bureau of American Ethnology, Bulletin 70. Washington.

FRANCISCAN FATHERS
1910. *An Ethnographic Dictionary of the Navajo Language.* St. Michaels, Arizona.

GAYTON, A. H.
1929. *Yokuts and Western Mono Pottery Making.* University of California Publications in American Archaeology and Ethnology, Vol. 24, No. 3.

GIFFORD, E. W.
1940. "Culture Element Distributions: XII, Apache-Pueblo." *Anthropological Records*, Vol. 4, No. 1. Berkeley.

GIFFORD, E. W., and W. E. SCHENCK
1926. *Archaeology of the Southern San Joaquin Valley, California*. University of California Publications in American Archaeology and Ethnology, Vol. 23, pp. 1–22.

GILMORE, MELVIN
1925. "Arikara Uses of Clay." *Museum of the American Indian, Heye Foundation, Indian Notes*, Vol. 2, p. 286.

GILLIN, J. H., quoted by E. W. HAURY
1937. In "Notes and News." AMERICAN ANTIQUITY, Vol. 2, No. 3, pp. 217–218.

HAILE, FATHER B.
1937. *Some Cultural Aspects of the Navajo Hogan*. Mimeographed.
1938. *Origin Legend of the Navaho Enemy Way*. Yale University Publications in Anthropology, Vol. 17.

HALL, E. T., quoted by E. B. RENAUD
1937. In *Archaeological Survey of the High Western Plains. Ninth Report*. Denver.

HARRINGTON, J. P.
1940. "Southern Peripheral Athapaskawan Origins, Divisions, and Migrations." In *Essays in Historical Anthropology of North America*, Smithsonian Miscellaneous Collections, Vol. 100. Washington.

HARRIS, W.R.
1909. *The Catholic Church in Utah*. Salt Lake City.

HIBBEN, F. C.
1937. *Excavations of the Riana Ruin and Chama Valley Survey*. University of New Mexico Bulletin, Anthropological Series, Vol. 2, No. 1. Albuquerque.
1938. "The Gallina Phase." AMERICAN ANTIQUITY, Vol. 4, No. 2, pp. 131–136.

HILL, W. W.
1936. *Navaho Warfare*. Yale University Publications in Anthropology, No. 5.
1937. *Navajo Pottery Manufacture*. University of New Mexico Bulletin, Anthropological Series, Vol. 2, No. 3. Albuquerque.
1938. *Agricultural and Hunting Methods of the Navaho*. Yale University Publications in Anthropology, No. 18.
1940. "Some Navajo Culture Changes during two Centuries (with a Translation of the Early 18th Century Rabal Manuscript)." In *Essays in Historical Anthropology of North America*, Smithsonian Miscellaneous Collections, Vol. 100. Washington.

HODGE, F. W.
1895. "The Early Navajo and Apache." *American Anthropologist*, Vol. 8, No. 3, pp. 223–240.
1916. In E. E. AYER, *The Memorial of Fray Alonzo de Benavides*, p. 244. Chicago.

HURST, C. T.
1939. "A Ute Shelter in Saguache County, Colorado." *Southwestern Lore*, Vol. 5, No. 3.

HUSCHER, H. A.
1939. "Drainage Pattern of the Uncompahgre Plateau." *Southwestern Lore* Vol. 5, No. 2.

HUSCHER, B. H., and H. A. HUSCHER
1939 and 1940. In *Reports of the Department of Archaeology, Colorado Museum of Natural History.* Denver.

JEANÇON, J. A.
1927. "Antiquities of Moffat County, Colorado." *The Colorado Magazine,* Vol. 4, No. 1.

JENNESS, DIAMOND
1940. In *Proceedings of the International Congress of Anthropological and Ethnological Sciences.* Copenhagen.

JUDD, N. M.
1940. "Progress in the Southwest." In *Essays in Historical Anthropology of North America,* Smithsonian Miscellaneous Collections, Vol. 100. Washington.

KEUR, D. L.
1940. "New Light on Navaho Origins." *New York Academy of Sciences, Transactions,* Section 2, Vol. 2, pp. 182–188.
1941. *Big Bead Mesa, An Archaeological Study of Navaho Acculturation, 1745–1812.* Memoirs of the Society for American Archaeology, No. 1. AMERICAN ANTIQUITY, Vol. 7, No. 2. Pt. 2.

KIDDER, A. V.
1920. "Ruins of the Historic Period in the Upper San Juan Valley, New Mexico." *American Anthropologist,* Vol. 22, No. 4, pp. 322–329.
1931. *The Pottery of Pecos, Vol. I, The Dull-Paint Wares.* Papers of the Phillips Academy Southwestern Expedition, No. 5. Yale University Press, New Haven.
1932. *The Artifacts of Pecos.* Papers of the Phillips Academy Southwestern Expedition, No. 6. Yale University Press, New Haven.

KIDDER, A. V., and A. C. SHEPARD
1936. *The Pottery of Pecos, Vol. II.* Papers of the Phillips Academy Southwestern Expedition, No. 7. Yale University Press, New Haven.

KLUCKHOHN, C., and K. SPENCER
1940. *A Bibliography of the Navaho Indians.* New York.

LOWIE, R. H.
1909. *The Northern Shoshone.* American Museum of Natural History, Anthropological Papers, No. 2.

MALCOLM, R. L.
1939. "Archaeological Remains, Supposedly Navajo, from Chaco Canyon, New Mexico." AMERICAN ANTIQUITY, Vol. 5, No. 1, pp. 4–20.

MANTZ, C. A.
1939. "The Corner-Tang Artifacts of Japan." Paper read at the Alpine, Texas, meeting of the American Association for the Advancement of Science.

MATTHEWS, W.
1902. *The Night Chant, a Navajo Ceremony.* American Museum of Natural History, Memoir 6.

MCKERN, W. C.
1937. "An Hypothesis for the Asiatic Origin of the Woodland Culture Pattern." AMERICAN ANTIQUITY, Vol. 3, No. 2.

MERA, H. P.
1935. *Ceramic Clues to the Prehistory of North Central New Mexico.* Laboratory of Anthropology, Technical Bulletin 8. Santa Fe.
1938. "Some Aspects of the Largo Cultural Phase, Northern New Mexico." AMERICAN ANTIQUITY, Vol. 3, pp. 236–243.

1939. *Style Trends of Pueblo Pottery in the Rio Grande and Little Colorado Cultural Areas from the Sixteenth to the Nineteenth Century.* Laboratory of Anthropology, Memoir 3. Santa Fe.

MINDELEFF, C.
1898. *Navajo Houses.* Bureau of American Ethnology, 17th Annual Report, pp. 475–517. Washington.

MINDELEFF, V.
1891. *A Study of Pueblo Architecture, Tusayan and Cibola.* Bureau of American Ethnology, 8th Annual Report. Washington.

MOOREHEAD, W. K.
1921. "Recent Explorations in Northwest Texas." *American Anthropologist,* Vol. 23, No. 1.
1931. *Archaeology of the Arkansas River Valley.* Yale University Press, New Haven.

MORRIS, R., E. GLAZIER and R. THALLON
1937. "Archaeological Report of the Canyon of Ladore-Yampa River Reconnaissance of 1936." *Trail and Timberline,* No. 219.

MORSS, NOEL
1931. *The Ancient Culture of the Fremont River in Utah.* Papers of the Peabody Museum of American Archaeology and Ethnology, Harvard University, Vol. 13, No. 3.

PAGE, G. B.
1937*a*. "The Navaho Sweat House." *New Mexico Anthropologist,* Vol. 2, pp. 19–21.
1937*b*. "Navajo House Types." *Museum of Northern Arizona, Museum Notes,* Vol. 9, No. 9, pp. 47–49.

PATTERSON, J. T.
1936. *The Corner-Tang Flint Artifacts of Texas.* University of Texas Publication 3618. Anthropological Papers, Vol. 1, No. 4.

PEARSALL, A.
1939. "Evidence of Pueblo Culture in the San Luis Valley." *Southwestern Lore,* Vol. 5, No. 1.

RAY, V. F.
1932. "Pottery on the Middle Columbia." *American Anthropologist,* Vol. 34, No. 1.

REAGAN, A. B.
1933. "Summary of Archaeological Finds in the Uintah Basin, in Utah, to Date." *Proceedings of the Utah Academy of Science, Arts and Letters,* Vol. 10.
1935. "Archaeological Field Work, Spring, 1935." *Proceedings of the Utah Academy of Science, Arts and Letters,* Vol. 12.

REED, E. K.
1941. "Information on the Navaho in 1706." *American Anthropologist,* Vol. 43, No. 3, pp. 485–487.

REITER, P.
1938. *The Jemez Pueblo of Unshagi, New Mexico.* Monograph of the School of American Research, No. 5. Santa Fe.

RENAUD, E. B.
1931. *Archaeological Survey of Eastern Colorado.* Denver.
1932. *Archaeological Survey of Eastern Colorado.* Denver.
1935. *Archaeological Survey of Eastern Colorado, Fourth Report.* Denver.
1937. *Archaeological Survey of the High Western Plains, Ninth Report.* Denver.

ROGERS, M. J.
1936. *Yuman Pottery Making.* San Diego Museum Papers, No. 2.

SAPIR, E.
1923. "A Note on Sarcee Pottery." *American Anthropologist,* Vol. 25, No. 2, pp. 247–253.
1936. "Internal Linguistic Evidence Suggestive of the Northern Origin of the Navajo." *American Anthropologist,* Vol. 38, No. 3.

SCHELLBACH, L.
1930. "Mr. Schellbach's Researches in Idaho." *Museum of the American Indian, Heye Foundation, Indian Notes,* No. 7, p. 123.

SHAPIRO, H. L.
1931. *The Alaskan Eskimo.* American Museum of Natural History, Anthropological Papers, Vol. 31, Pt. 6.

SMITH, E. R., quoted by E. W. HAURY
1940. In "Notes and News," AMERICAN ANTIQUITY, Vol. 5, No. 4, p. 344.

SMITH, H. I.
1910. "An Unknown Field in American Archaeology." *American Geographical Society,* Bulletin 42, No. 7.

SPIER, L.
1928. *Havasupai Ethnography.* American Museum of Natural History, Anthropological Papers, Vol. 29, Pt. 3.

STALLINGS, W. S., JR.
1937. "Southwestern Dated Ruins: I." *Tree-Ring Bulletin,* Vol. 4, No. 2, pp. 3–5.

STEWARD, J. H.
1933. *Ethnography of the Owen's Valley Paiute.* University of California Publications in American Archaeology and Ethnology, Vol. 33, No. 3.
1936. *Pueblo Material Culture in Western Utah.* University of New Mexico Bulletin, Archaeological Series, Vol. 1, No. 3.
1937*a*. *Ancient Caves of the Great Salt Lake Region.* Bureau of American Ethnology, Bulletin 116. Washington.
1937*b*. "Petroglyphs of the United States." *Smithsonian Institution, Annual Report, 1936.* Washington.
1939. *Notes on Hillers' Photographs of the Paiute and Ute Indians Taken on the Powell Expedition of 1873.* Smithsonian Miscellaneous Collections, Vol. 98, No. 18. Washington.
1940. "Native Cultures of the Intermontane (Great Basin) Area." In *Essays in Historical Anthropology of North America,* Smithsonian Miscellaneous Collections, Vol. 100. Washington.
1941. "Culture Element Distributions: XIII, Nevada Shoshone." *Anthropological Records,* Vol. 4, No. 2. Berkeley.

STRONG, W. D.
1935. *An Introduction to Nebraska Archaeology.* Smithsonian Miscellaneous Collections, Vol. 93, No. 10. Washington.

TANNER, C. L.
1936. "Blackstone Ruin." *The Kiva,* Vol. 2, No. 3.

THOMAS, A. B.
1932. *Forgotten Frontiers.* Norman, Oklahoma.
1935. *After Coronado.* Norman, Oklahoma.

TSCHOPIK, H.
1941. *Navajo Pottery Making, An Inquiry into the Affinities of Navajo Painted*

Pottery. Papers of the Peabody Museum of American Archaeology and Ethnology, Harvard University, Vol. 17, No. 1.

UGARTE Y LOYOLA, J.
1788. *Archive No. 1022*, New Mexico Historical Society.

VAN VALKENBURGH, R. F.
1938*a*. "A Striking Navaho Petroglyph." *Southwest Museum, The Masterkey*, Vol. 13, No. 4, pp. 153–157.
1938*b*. *A Short History of the Navajo People*. United States Department of the Interior, Navajo Service, Window Rock, Arizona.
1940. "We Found the Ancient Tower of Hask-hek'izh." *Desert Magazine*, Vol. 3, No. 8.
1941*a*. *Dine bikeyah*. United States Department of the Interior, Navajo Service, Window Rock, Arizona.
1941*b*. "New Light on Navaho Migrations." *Gallup Gazette*, Vol. 7, No. 43, August 12, p. 9.

WHEELER, S. M.
1938. "A Fremont River Moccasin from Nevada." *Southwest Museum, The Masterkey*.

WOODBURY, G., and E. WOODBURY
1932. "Archaeological Survey of the Paradox Valley." *The Colorado Magazine*, Vol. 9, No. 1.

WORMINGTON, M.
1940. In *Report of the Department of Archaeology, Colorado Museum of Natural History for the year 1939*, pp. 19–26. Denver.
1941. In *Report of the Department of Archaeology, Colorado Museum of Natural History for the year 1940*, pp. 20–22. Denver.

Top left: Spider Rock Hogan No. 1 (1758). *Top right:* Interior, Spider Rock Hogan No. 1, showing method of interlocking timbers. *Lower left:* Six-sided Hogan at Spider Rock (1770). *Lower right:* Sherds of Navaho polychrome pottery from Spider Rock Hogan Group 1.

Iroquoian figurines. *a-c*, Cayuga figurines from grave on Genoa site; *d-p*, Cayuga figurines from Genoa and contiguous sites; *q-t*, Seneca figurines from Dutch Hollow site (courtesy of Rochester Municipal Museum). *d*, about four inches long; *r*, exactly three inches long.

IROQUOIAN FIGURINES[1]

EDMUND CARPENTER

IN EARLY publications on the archaeology of central and western New York, references may be found to "dolls" and "effigies carved to represent the human figure." The presence of these small, human effigies carved from bone and antler, in the graves of infants from early contact Cayuga and Seneca interments, excited the curiosity of early writers. It is not surprising, therefore, to find almost as many diverse and sundry opinions concerning their probable use and significance as there were figurines or writers. Unfortunately, but few figurines were excavated in a scientific manner, and only scattered records are left with which to work. Several amateur archaeologists, however, did keep accurate notes, and combining these with notes recorded on museum excavations, a small amount of data has been compiled from which conclusions may be drawn. In all, nearly a hundred figurines were located by my search[2] in museums and private collections, and possibly many more exist.

All Iroquoian figurines which I have examined are strikingly similar. In general, they are delicately carved of bone or antler to represent a nude female figure with the hands covering the sex organs. They average four inches in length, and are usually found in the graves of children and infants.

DISTRIBUTION

Distribution of Iroquoian figurines appears to be confined, in the order of number found, to the State of New York, southern Ontario, and Pennsylvania. The center seems to be the area occupied by the historic Cayuga and Seneca nations. There the custom prevailed most noticeably, while in regions of Iroquois domination only scattered finds are known. A Cayuga site of about 1650 near Genoa, New York, alone has yielded at least forty figurines and four blank blocks from which they are made. Figurines found at Genoa came from both graves and refuse deposits. The following collector's notes are typical of Genoa and adjacent sites of the same period. They may be taken as representative of Cayuga burials with figurines.

Site: Genoa Grave: child Age: about 6

Mortuary Offering: four perforated figurines. One, perfect—even showing fingers,—found on chest in situ, as pendant on small necklace. Three other figurines found

[1] I am greatly indebted to Mr. William A. Ritchie, Dr. Frank G. Speck and the late Dr. V. J. Fewkes for assistance on this manuscript.

[2] Specifically prepared questionnaires were sent to museums and private collectors.

in association with three strings of trade beads so as to indicate the use of the figurines as pendants.

Site: Genoa Grave: child Age: 10
Sex: female Position: sitting
Mortuary Offering: metal bracelet on arm. Figurine perforated through neck and strung with a string of blue beads.

Site: Genoa Grave: adult
Sex: male
Mortuary Offering: figurine strung as central figure or pendant on necklace of ninety-four tubular shell beads.

Figurines are somewhat rarer on Seneca sites. Houghton states:[3] "very interesting, indeed, is a small effigy carved in the round in bone to represent the human figure. At least two of these, possibly more, were found in graves. It is noteworthy that, to the writer's knowledge, these are the only ones found on a Seneca site." Both figurines mentioned by Houghton come from the Factory Hollow site, an early contact Seneca village.

In 1935, the Rochester Municipal Museum excavated, under the leadership of William A. Ritchie, a cemetery on the nearby Dutch Hollow site near East Avon, New York. The site is Seneca, dating from approximately 1620 to 1640. Field notes on four figurines are here cited[4] and also the notes on two more removed from the same burial ground by a private collector. They are typical of Seneca graves where figurines exist as mortuary offerings.

Burial 41: Dutch Hollow Child (5 to 6 years) and adult male
Child: lying on left side; headed south; facing west.
Grave goods: four bear claws back of head and a human effigy of antler. Figurine unperforated.
Adult: lying on left side; headed south; facing west.
Depth to skull 3′5″, bones in bad condition; diameter of grave 5′6″. Grave soil much stained with heavy bands at various levels.
Grave goods: two pottery vessels, crushed by rock, one at knee and one near head; a turtle shell rattle rested at base of skull.

Burial 67: Dutch Hollow.
Grave of child (about 6 years); depth 2′7″, grave dimensions 2′×2′8″, skeleton facing east; headed northwest; on back; loosely flexed; poor condition; right arm lay close to side, hand on stomach. Soil—sandy loam, on top and clay in bottom of grave.
Grave goods: near left side of face a number of small bird bones lay, immediately to right of skull lay a pottery vessel on its side with turtle shell rattle inside. Vessel perfect except for a single small crack. Under rim lay an antler effigy figurine of human and also a similar one lay near right humerus; around the neck were small vari-colored glass beads and seven larger blue and white ones.

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[3] Houghton, 1922.
[4] Courtesy of the Rochester Museum of Arts and Sciences.

Burial 69: Dutch Hollow.
Grave of child (about 4 years); depth 1′11″; skeleton facing south, headed west; on right side; loosely flexed; in poor condition.
Grave goods: left hand held effigy near face; right hand across lower chest; over right arm was evidently a belt or pouch containing many beads of various colors; large pot broken in front of face; small pot 3″ from flexed knees; in front of this was a number of blue, round beads, and in the center are two drilled stones and some bird bones. First pot upright; small pot lay on side; one triangular arrow near small pot; brass bracelet inside small pot.

Private Collection: Dutch Hollow.
Child (9 to 11 years); headed east by south; hands before face.
Remarks: antler effigy near hands on lower chest, stained by copper. May have been pendant. Large glass beads. Small sections of brass bracelet over arm and effigy. Hands of figurine on lower chest. Hand appears to have held effigy near face.
Private Collection: Dutch Hollow.
Child (5 to 7 years): headed south; hands left under chin, right over right knee.
Remarks: small barrel shaped beads over neck and chest. Figurine lying on left of sternum. Near knees and right hand four triangular points; wild pigeon bones back of skull; small sections of brass throughout the grave fill. Figurine: left hand on shoulder; right on pelvis; stained by copper.

A bone image of a small child, smoothly carved, from the Mohawk Valley is illustrated by Beauchamp,[5] and another, of the conventional nude female figure, from the vicinity of Cazenovia, Madison County, is in the possession of the Museum of the American Indian, Heye Foundation. A human effigy of bone from Sammonsville, New York, and another bone figurine from Madison County are in the collection at the New York State Museum. An unperforated, bone specimen with hands at sides and another of shell came from an early contact (1650) Wappinger cemetery of the Kitchawanks at Croton, New York. It seems improbable that any human effigies will appear from Delaware sites.[6] Skinner reports an antler figurine from an ash-bed on an ancient Wenro village site on Buffalo Creek, just west of the town line in East Elma, New York, as follows:[7]

The figure seems to have been intended for suspension, perhaps as a pendant from a necklace, as its neck is perforated from the side in such manner that, however hung, it would always face outward. The hands—one raised, the other resting on the pelvis—are in a position characteristic of those of Iroquois bone images. Although the figure is represented as nude, the fact that the hair is gathered in a queue or braid behind, reveals something of Wenro customs, valuable because this Iroquoian tribe was so early exterminated that few of their artifacts have found their way into museum collections.

Among the present-day Seneca, in whom, history tells us, still courses some Wenro blood, it is said that their ancestors, if indeed the custom is not still maintained in

[5] Beauchamp, 1902. [6] Lindstrom, 1654–1656.
[7] Skinner, 1920.

secret, utilized similar bone images in the practice of witchcraft, and bone and antler figurines have been obtained in the ash-beds and graves of their ancient sites.

Such bone and antler images, however, are exceedingly rare, for of the thousands of specimens of these materials from the several known Iroquois tribes, fewer than a dozen figurines have been reported, and of these the one referred to is the best.

The Wenro tribe was removed from their original territory in 1637. Therefore, the figurine must be prior to this date.

Harrington discovered a good example on the Silverheels site south of Lake Erie on Cattaraugus Creek, for the Peabody Museum of Harvard. The site is Seneca, dated after 1655. The effigy is of bone, neatly carved, and with no trace of arms or legs. It was found in an infant's grave accompanied by scattered glass beads and small copper beads, covered with verdigris, which still adhered in strings. Of its probable use, Harrington states:[8]

When this figure was shown to the Seneca, they informed us that the 'Ga-ya'-da' or image was a very powerful 'witch' charm, and that similar ones had been often used by their men of magic. They even told stories of finding such an image amid the belongings of a deceased mystic, done up in a large ball of cloths and skins, the inner of which was soaked with blood. Personally, I think that if the image had been so highly thought of in ancient times it would never have been buried with an infant, and that it probably was merely a toy—a doll for the child to play with in Spirit Land.

Cadzow found a typical example in a pit on the Schultz site[9] in Lancaster County, Pennsylvania. The site is Susquehannock, and the artifacts indicate a long prehistoric occupation followed by a brief contact with white men. The figurine, made of bone, represents a nude female, one hand on the breast and the other on the genital. A local collector found a bone figurine, with hands on hips, in a grave on the nearby Washington Borough site, which is identical in every respect with a figurine from the King's Mounds at Wickliffe, Kentucky.[10] It is interesting to note that the effigy from the King's Mounds was found with an infant burial in the Children's Mound. These two specimens from Pennsylvania and Kentucky differ slightly from true Iroquoian figurines.

The present war has greatly hindered the facility of obtaining data from Canada. However, references to several figurines may be found in Canadian reports. Boyle,[11] held the opinion that figurines were usually scarce. In an article entitled *The Human Form in Indian Art*, he states: "Had bone been employed to any extent numerous specimens (of human effigies) would have been found by this time." Boyle knew of but one figurine, of bone, perforated, and carved in slight relief with the right hand covering the left breast and the left hand crossed to the waist at the right side, probably the work of the Neutrals since it was found in the township of Beverly, Wentworth County, Ontario.

[8] Harrington, 1922. [9] Cadzow, 1936, p. 179, ill. 115.
[10] King, 1939. [11] Boyle, 1900.

A figurine of a nude female, with the left hand on the right breast and the right hand missing, is illustrated in the Ontario Report for 1896–1897.[12] It is carved from light grey steatite and was found on the "Old Fort Site" at Witchurch, Ontario. A small figurine of bone with a perforation through the neck for suspension comes from a post-European Iroquois site,[13] and another comes from a Tionontati site[14] of the same period. The Tionontati or Tobacco people were exterminated prior to 1650. Another specimen from Ontario is of bone and about four inches in length. Nothing is known of its origin, as far as I have been able to trace, but it is presumably the product of Ontario Indians.[15]

A few figurines located in outlying districts from the Seneca and Cayuga areas have not been mentioned here because lack of sufficient data renders them of dubious value. Unquestionably, many more exist in collections. Although questionnaires were sent to Ohio, Michigan, and eastern Pennsylvania, no examples of the true, full-length image could be located. Aside from the Cayuga and Seneca nations, typical figurines existed among the Mohawk, Oneida, Mahikan, Tionontati, Neutrals, Wappinger, Susquehannock, Onondaga, and Wenro. It is well within reason to suppose that other tribes adopted similar figurines.

DESCRIPTION

Like the antler combs, bone and antler figurines were made from "blocks." In the majority of cases, the Iroquois carved their figurines from antler or bone; rarely does an image appear in any other material. The previously mentioned fetish of steatite; a shell figurine from a burial at Genoa and another from a grave at Croton; and three, one of a pregnant woman, carved from wood, are the only exceptions that are unquestionably authentic.[16] One wooden figurine, perforated transversely through the neck, was found in a grave on the Pratts Falls site, seven or eight miles southwest of Indian Hill. The figurine is a nude female figure, three and a half inches high, with arms crossed on breast. Graves yielded brass kettles, iron axes, and rolled copper, but no Jesuit relics. The only other figurine with hands crossed on breast is of antler, three inches in length, and from the same vicinity. The presence of wooden effigies brings to mind the possibility that numerous human images made of perishable material may have long since decayed and disappeared.

Perforated figurines are not always the rule. It is well within reason

[12] *Ibid.* [13] Boyle, 1896–1897.

[14] Boyle, 1886–1887, Fig. 106. [15] Wintemberg, 1929.

[16] Earthenware figurines from Pennsylvania and New Jersey do not follow the general characteristics of the Iroquois specimens.

to suppose that unperforated specimens may have been tied around the neck for suspension if, indeed, they were ever meant for pendants. At least one figurine examined bore a groove around the neck for this purpose. Drilling resulted in the weakening of the figurine at its neck, and it is not surprising to find effigies lacking heads. In all probability, heads, broken from figurines, exist in collections under various catalogue definitions.

Figurines take several forms: the nude female with hands in varied positions; male effigies; and figures, with no trace of arms or legs, tentatively called "baby" figurines. Female figures are by far the most common, comprising about 93% of the examples. In some cases they show sex, and in most the feet are fused into one, forming a ball. A grave at Genoa held a pair of figurines, one representing a male and the other a female. Another grave at Genoa produced four figurines: one male effigy and three female figures. Both of these male figurines show the phallus. Baby effigies may simply be a result of the carver's inability to cut out the arms and legs, giving the finished product the appearance of a child. However, what might be finished for one man would not be complete enough for another, and I think it may be safely assumed that the so-called "baby" figurines do not depict infants.

On the female images, the hands vary in position: right hand on breast, left on pelvis; left hand on breast, right on pelvis; both hands on pelvis; right hand on right shoulder, left on left shoulder; right hand on left shoulder, left on right shoulder; both hands at base of neck; both hands on knees; both hands at sides. The first two are found in well over half of the specimens, and are strikingly similar to the figurines found on certain antler combs. The position with hands on knees is the one most commonly taken by human figures in relief on the pots of the Seneca and Cayuga. Occasionally, figures on pots have the hands with one over the breast and the other on the pelvis.

Antler and bone combs of approximately the same period and somewhat later, often have human figures with the hands in the foregoing positions, carved at the top. There appears to be a definite connection between this type of comb and figurines. It is probable that the design of the combs resulted from copying figurines, and that there is no religious parallel.

Interesting, indeed, are the headdresses and the manner in which the hair is gathered in the back. Both of these features prevail more noticeably in the Cayuga specimens; their appearance is rare on Seneca figurines. One Seneca piece with a prominent headdress is illustrated by Beauchamp, who believes it probably represents the symbolic horns of

an Indian chief.[17] It was found near West Bloomfield, New York, where at least three others have been found, in the grave of an adult and child with bone beads and copper wire as mortuary offerings. The Wenro figurine carried both headdress and queue, and a Genoa effigy had a bear as a headdress. Well over half of the Cayuga specimens carry these features while seldom does a Seneca example appear with either headdress or queue. Two perforated figurines with Quaker-like hats, knee breeches, and hands at sides were found in an ash dump on the Valley Mills site, a Cayuga station of about 1665.

In all cases of perforated figurines occurring in graves where accurate field notes were taken, either trade, shell, or bone beads were present. Several graves had the figurines in situ as a pendant on a necklace. Therefore, we must definitely consider the figurine as a pendant. Nearly all typical figurines found in well recorded burials were in the graves of children from 4–6 to 9–11 years in age with six as the average. Unfortunately, the sex of the children could not be determined. Numerous figurines, especially broken specimens, have been found in refuse deposits, and at least one has been excavated from the grave of an adult.

CONCLUSIONS AND DATING

The use of Iroquoian figurines can be summarized by saying that they served as pendants on the necklaces of children, and that they formed a part of the religious worship of the Iroquois. Dr. Arthur C. Parker explains the effigies by stating:[18]

> The bone and antler effigy of a human figure, commonly called the "bone dolls," found in Seneca sites in western New York and contiguous regions, represent a character in Iroquois folk-lore. They are believed to have magical import and to have the power of apprising their owner of approaching danger.

The figurines or amulets seem to represent some sociological religious idea with sporadic occurrence in the East that has no recorded analogy.[19] The headdress and gathering of the hair in the back are probably a regional expression of a widespread custom.

The question whether Iroquoian figurines date back to prehistoric times has been discussed by several authors. Beauchamp writes:[20]

> Artistic results in bone carving could hardly be expected before the Indians had metallic tools. So, when a well worked face or head appears, it is natural to infer these (as products of metallic tools) even on what seem prehistoric sites.

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[17] Beauchamp, 1902. [18] Personal communication, July 1, 1940.

[19] David Zeisberger mentions effigies of the human head, worn on a string around the neck, and worshipped as a god by the Seneca. [20] Beauchamp, 1902.

Parker also noted that the figurines had come from sites believed to be pre-colonial, and states:[21]

> Small effigies of animals were sometimes cut out of flat bone and larger effigies of the human figure were carved from heavier bone. Some of these are apparently pre-colonial. The modern Seneca say that their ancestors carved small images of the human figure to represent a witch and by placing them in a bag or other receptacle were able to prevent the evil influence of the witch after which the effigies were named.

It is hoped that these questionable pre-contact figurines may be examined with a fluoroscopic lamp some time in the near future.

In view of new evidence, it would seem highly probable that the human figurine of the characteristic nude female figure came as a result of influence from the whites, the position of the hands suggesting Jesuit missionaries. Influences from the east could easily have preceded the presence of the whites, and hence the lack of contact material on certain sites producing figurines.

Numerous figurines from Woodland sites were examined. All of these early images seemed to fall into a category separate from that of the Iroquois specimens, and nothing that could be definitely associated with the objects under discussion was seen, although certain examples bore some resemblance.

An attempt to date figurines, presents a problem that is far from simple. This much we definitely do know: The Wenro specimen was prior to 1637, the Silverheels after 1655, the Tionontati before 1650, the Susquehannock before 1675, and the figurines from Seneca villages burned by deNonnville, before 1687. Specimens from Factory Hollow site were produced before 1650, and those found at Dutch Hollow before 1640. The site of the Seneca capitol on Boughton Hill has not, as far as I can determine, yielded any figurines. Boughton Hill station flourished from 1650–1687. No specimens found to date on the Dann farm, a later Seneca site, are characteristic of Iroquoian figurines. A rough approximation on the dates of these images would be from 1590 to 1660, with the climax in number produced between 1635 and 1655.[22]

The large majority of figurines were made by the Cayuga and Seneca nations, and outlying figurines probably are the result of a strong influence from these two tribes. Comparison of the dates of earliest Seneca specimens with the earliest known Cayuga ones evidences a possibility of Seneca origin.

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[21] Parker, 1922, p. 117, Fig. 12.

[22] Since the completion of this article, a contact Cayuga pipe from Bainbridge, New York, in the collection of Mr. William Fuellhart of Tidioute, Pennsylvania, has been brought to the writer's attention. Two figurines of nude females with hands on knees are carved in bold relief on either side of the bowl. The pipe is of yellow quartzite, and its form is the simple vase bowl. It is unquestionably of the 1630–1660 period.

BIBLIOGRAPHY

BEAUCHAMP, W. M.
1902. *Horn and Bone Implements of the New York Indians.* New York State Museum, Bulletin 50.

BOYLE, DAVID
1886–1887. "Archaeological Report." *Annual Report of the Canadian Institute.* Toronto.
1896–1897. "Archaeological Report." *Annual Report of the Canadian Institute.* Toronto.
1900. "Archaeological Report." *Annual Report of the Ontario Museum.* Ottawa.

CADZOW, D. A.
1936. *Archaeological Studies of the Susquehannock Indians of Pennsylvania, Safe Harbor Report 2.*

HARRINGTON, M. R.
1922. "A Mid-colonial Seneca Site in Erie County." In A. C. PARKER, *Archaeological History of New York.*

HOUGHTON, F. M.
1922. *The Archaeology of the Genesee Country.* New York State Archaeological Association, Vol. 3, No. 2.

KING, B. B.
1939. *Under your Feet.*

LINDERSTROM, P.
1925. *Geographia Americae, 1654–1656.* Edited by Amandus Johnson. Swedish Society of Philadelphia.

PARKER, A. C.
1922. *Archaeological History of New York.* New York State Museum, Bulletins 235–238.

SKINNER, A.
1920. *An Iroquois Antler Figurine.* Museum of the American Indian, Heye Foundation, Indian Notes and Monographs, Vol. 2, No. 5.

WINTEMBERG, W. J.
1929. *Annual Report of the National Museum of Canada.*
1931. *Distinguishing Characteristics of Algonkian and Iroquoian Cultures.* National Museum of Canada, Bulletin 67.

Philadelphia, Pennsylvania
July, 1941

VLADIMIR J. FEWKES

J. ALDEN MASON

RELIEF from several years of pain came to Vladimir J. Fewkes in the University Hospital, Philadelphia, December 11, 1941. His outstanding personality is missed by his colleagues and associates who, however, rejoice that his sufferings are over. He is survived by his widow, Berenice B. Fewkes of Philadelphia.

Dr. Fewkes was born in Nymburk, Czechoslovakia, March 23, 1901. His family was old and prominent in Bohemia; his father was a member of the first Senate of the Czech republic and a close friend of Masaryk. After four years of service in the first World War, Dr. Fewkes came, as a practically penniless immigrant, speaking no English, in 1921, to Philadelphia. His great adaptability is evidenced by the fact that those who met him first a few years later seldom suspected his foreign birth; he had no trace of an accent and was in all respects typically American.

His first few years in this country were hard, but in six years he had worked his way through the University of Pennsylvania, graduating with the degree of Bachelor of Science in Economics in 1926. From 1923 to 1929 he held various University scholarships and fellowships. Becoming interested in anthropology he received his master's degree in 1928 and his doctorate in 1930 from the same University. During most of his five years of graduate work he was Assistant or Instructor in the Department of Anthropology and thereafter a Research Associate in the University Museum.

From 1927 until 1937 Dr. Fewkes was engrossed almost exclusively in studies of Central European archaeology, for which he had unusual equipment in his knowledge of the region and its languages. In 1927 he was fellow in the American School of Prehistoric Research, and in 1928 and 1929 did special work at Charles University, Prague. In the summer seasons of 1929 to 1931 he conducted joint expeditions in the Danube Valley for the University Museum and the Peabody Museum of Harvard University. Most of this time was spent in excavations at the neolithic site of Homolka in his native Bohemia. Here, with a thoroughness rarely attempted in central Europe, he excavated a late neolithic village of about 2000 B.C. which exhibited not only eastern and southern elements but Baltic ones as well.

In 1931 he made an archaeological reconnaissance of Jugoslavia, and in 1932 directed a joint expedition of the Peabody Museum, the American School of Prehistoric Research and the Fogg Museum of Art to Serbia, where he excavated the site of Starčevo, belonging to the very earliest farming and pottery-making phase of the East European Neolithic, dating well back into the fourth millennium B.C.

Until 1937 Dr. Fewkes was associated with the Peabody Museum, working on the material obtained on his expeditions in Central Europe. During this time he was also closely associated with the American School of Prehistoric Research, as Associate Director from 1932 to 1934, and Acting Director in 1938. During these years he directed its summer school at his excavations in Central Europe.

Dr. Fewkes naturally very early became interested in the problems of American archaeology. In 1929 he commenced the work of cataloguing and revising the archaeological collections in the New Jersey State Museum, preparatory to the opening of the new Museum building. While he remained there only a few months his work and enthusiasm largely supplied the inspiration that resulted in the New Jersey WPA. Indian Site Survey Project and in the formation of the Archaeological Society of New Jersey. His first extensive excavation in America was in 1937 when he superintended the excavations at the Irene Mound near Savannah, Georgia, a WPA. project sponsored by the Savannah Chamber of Commerce.

In 1938 Dr. Fewkes returned to Philadelphia to supervise WPA. projects in the University Museum. At first in charge of bibliographical research in ceramics, he later took over the ceramic technological laboratory as well. His main interest was always in technological problems, and during his later years he specialized in ceramic technology. He conducted a long series of experiments and researches into the technical and chemical problems of pottery making. Particularly he investigated and reproduced Catawba pottery and, as a result, wrote his major work, "Catawba Pottery Making." This, fortunately, he completed before his death, and it will probably be published in the Proceedings of the American Philosophical Society. He was chairman of the Committee on Ceramic Terminology and Classification of the Society for American Archaeology, and one of his colleagues expresses the opinion that "his accuracy in terminology and meticulousness in research have been of great importance in the development of ceramic technology."

Dr. Fewkes was more honored in Central Europe than in America. He was an honorary member of three Jugoslav, one Hungarian and three American scientific societies; and fellow, correspondent, or research associate of ten Czechoslovakian and three Jugoslav museums or institutes. He was decorated by two central European governments, receiving the White Lion of Czechoslovakia and the Royal Crown of Jugoslavia; he was the only archaeologist to hold the latter decoration. He held honorary degrees from Charles University in Prague and from the University of Belgrade. He was a member of most of the local and national American anthropological and archaeological organizations, of Sigma Xi, and was a Contributing Editor to the American Journal

of Archaeology and to several scientific journals in Central Europe.

Vlad. Fewkes' outstanding characteristics were physical and mental vigor, energy, joy in life, and democracy. He made friends easily and had many loyal ones. He spoke and wrote English excellently and had a scientific reading knowledge of fifteen European languages, and a conversational knowledge of twelve. He was intensely interested in local Czech organizations, and was an outstanding American citizen of Czech origin.

His colleagues attest to his linguistic ability, boundless energy and interest. One says of him: "Fewkes had a prodigious, well-organized and profound knowledge of the archaeology of Central Europe. He was an indefatigable and courageous worker and never spared himself in the pursuit of his researches. Indeed, it was his insatiable thirst for more knowledge on all aspects of the problem he had before him that proved his great fault, for this continually delayed the publication of his results and leaves us with very little in the way of major publication to show for the ability and concentration which he brought to bear on his work."

The truth of the latter statement is borne out by the large number of unfinished manuscripts in his bibliographical list which, of course, are not included in the following list of his published works. In addition to the titles listed in this bibliography, Dr. Fewkes wrote more than twenty very fine book reviews which limitations of space, unfortunately prevent listing. His reviews, which covered a wide range of subject matter, appeared in the *American Anthropologist*, *American Journal of Archaeology*, and *Classical Weekly*.

BIBLIOGRAPHY

1929. "The Paleolithic Period in Central Europe." *Bulletin 5, American School of Prehistoric Research*, pp. 20–26, New Haven.

1930*a*. "Archaeological Discoveries in Czechoslovakia." *Art and Archaeology*, Vol. 29, No. 4, pp.182–183.

1930*b*. "Archaeologické práce Americké Espedicě Tišicich." *Ročenka Okresní Jednoty Muzejní*. Brandýs n.L., Vol. 5, pp. 5 ff.

1931. "The Prehistory of Jugoslavia," by Vladimir Fewkes and M. Grbič. *Discovery* (University Museum), Vol. 1, No. 8, pp. 247–251.

1932. "Excavations in the Late Neolithic Fortress of Homolka in Bohemia. A Preliminary Report." *Proceedings of the American Philosophical Society*, Vol. 71, No. 6, pp. 357–392, Philadelphia.

1933*a*. "Excavations at Starčevo, Yugoslavia. Seasons 1931 and 1932," by Vladimir Fewkes, H. Goldman and R. W. Ehrich. *Bulletin 9, American School of Prehistoric Research*, pp. 33–54.

1933*b*. "Preliminary Report on an Archaeological Reconnaissance in Jugoslavia. American Expedition Season 1932," by Vladimir Fewkes, H. Goldman and R. W. Ehrich. *Bulletin 9, American School of Prehistoric Research*, pp. 17–32.

1934*a*. "Archaeological Reconnaissance in Yugoslavia, 1933." *Bulletin 10, American School of Prehistoric Research*, pp. 29–60.

1934*b*. "Report on the 1933 Summer Course of the American School of Prehistoric Research." *Bulletin 10, American School of Prehistoric Research*, pp. 21–27.

1935*a*. "Cinerary Urn Graves at Křepenice, Bohemia," by Vladimir Fewkes and Jaroslav Boehm. *Bulletin 11, American School of Prehistoric Research*, pp. 31–42.

1935*b*. "Explorations in Yugoslavia and Czechoslovakia." *Bulletin 11, American School of Prehistoric Research*, pp. 7–30.

1935*c*. "On the Interpretation and Dating of Vinča." *Proceedings of the American Philosophical Society*, Vol. 75, No. 7, pp. 651–672.

1936*a*. "Neolithic Sites in the Moravo-Danubian Area." *Bulletin 12, American School of Prehistoric Research*, pp. 5–81.

1936*b*. "Pre-Únětice Skeletal Graves at 'Piskovna.' Dolni Počernice," by Vladimir Fewkes and L. Jansová-Horakova. *Bulletin 12, American School of Prehistoric Research*, pp. 83–123.

1936*c*. "Recent Archaeological Discoveries in Jugoslavia." *American Journal of Archaeology*, Vol. 40, No. 1, pp. 125–126.

1937*a*. "Aboriginal Potsherds from Red River, Manitoba." AMERICAN ANTIQUITY, Vol. 3, pp. 143–155.

1937*b*. "Neolithic Sites in the Yugoslavian Portion of the Lower Danubian Valley." *Proceedings of the American Philosophical Society*, Vol. 78, No. 2.

1938*a*. "Irene Mound Excavations, Savannah, Georgia." *Proceedings of the Society for Georgia Archaeology*, Vol. 1, No. 2, pp. 24–31.

1938*b*. "Notes and News, Southeastern Area." AMERICAN ANTIQUITY, Vol. 4, pp. 72–73.

1938*c*. *W.P.A. Excavations at Irene Mound, Savannah; Georgia*. (Mimeographed Report.) Savannah.

1939*a*. "A Report on the 1938 Summer Course of the American School of Prehistoric Research." *Bulletin 15, American School of Prehistoric Research*, pp. 6–12.

1939*b*. "U.S.S.R. Archaeology." *American Journal of Archaeology*, Vol. 43, No. 4, pp. 692–695.

1940. "Methods of Pottery Manufacture." AMERICAN ANTIQUITY, Vol. 6, pp. 172–173.

1941*a*. "The Function of Paddle and Anvil in Pottery Making." AMERICAN ANTIQUITY, Vol. 7, pp. 162–164.

1941*b*. "A Preliminary Report on Pottery Making at Gay Head, Martha's Vineyard, Massachusetts." AMERICAN ANTIQUITY, Vol. 7, pp. 67–68.

1942. "Slip in Archaeological Pottery." AMERICAN ANTIQUITY, Vol. 8, pp. 118–119.

To be published:

Catawba Pottery Making. (Accepted by American Philosophical Society for publication in *Proceedings* or *Transactions*.)

University Museum
Philadelphia, Pennsylvania
March, 1942

FACTS AND COMMENTS

SLIP IN ARCHAEOLOGICAL POTTERY[1]

It is well known that the term slip, as used among archaeologists, has no uniform connotation; nor has it been defined satisfactorily either by archaeologists or by technologists. The loose and indiscriminate practice of subjective "slip reckoning" has produced numerous fallacies and untenable "classifications" in literature. The purpose of this note is to consider the properties and functions of a slip with respect to *archaeological* pottery. Any concern with historical retrospects of cogent nomenclature, or with individual instances illustrating misconceptions and confusions, lies outside my present scope. Nor is it my intention to settle any "problem."

If I understand properly the criteria and the functional role of a slip, as revealed by unambiguous examples, the following are among its characteristic distinctions:

1. A slip is always made of clay; irrespective of its color before or after firing, the main constituent must be a clayey substance. Naturally, the density of the slip, recognized as texture in the fabric (i.e., the fired piece), is conditioned by the proportion of water, coloring media, etc.
2. A slip is always applied to the recipient piece of pottery before firing.
3. A slip is always tantamount to an added surface thickness no matter how thoroughly blended it may appear to be with the recipient.
4. The qualitative properties of a slip differ perceptibly from those of the recipient. Unless a distinct contrast between the two be objectively determinable in the fabric, there can be no valid claim for a slip.
5. The qualitative differences rest on the nature of the composition, on the textural conditions, and on the color (resulting from firing) of a slip.

To determine the essential principle of qualitative differences between a slip and its recipient may require different methods. Microscopic routine with thin sections may be necessary in certain instances. Sometimes a strong lens may suffice in examination of sherds. Indeed, in some cases even the naked eye may prove adequate for conclusive identification.

Quantitatively, the thickness of a slip may possibly be a helpful determinant. Moreover, a separate layer identifying a slip may be recognizable through the orientation of its constituent particles; that is to say if such orientation differs from that revealed in the recipient piece.

The functional utility of a slip is quite variable; perhaps the most constant purposes serve two ends:

1. A slip often constitutes the final surface finish. In cases of colored slips, such a purpose may imply additional values.
2. Quite commonly, a slip provides specifically desired or requisite ground for decoration, chiefly painting (executed before firing) and crustation (executed after firing).

The means of applying a slip are indeed many. Whether they are in themselves potentially valuable as distinguishing criteria remains to be tested and proved. The question respecting the state of the medium applied, whether fluid, paste, or powder, is likewise far from comprehensively understood and experimentally investigated.

Viewed in the light of the stipulated criteria and functions, any case of a slip should lend itself to objective examination. There is no methodological justification for distin-

[1] This paper was prepared by Dr. Fewkes for presentation at the meetings held in Andover, Mass., December 27–30, 1941. His illness and untimely death prevented his attendance. Ed.

guishing a "wash" from a "slip" for, as revealed by critical inquiry, the *assumed arbitrary distinction* cannot be upheld technologically. Obviously, there is urgent need of scrupulous objectivity in calling a surface slipped. It may seem superfluous to insist here that a *glaze* is not a slip, and yet it may not be amiss to mention the distinction in passing. (Glazing depends upon physical and chemical alterations which are totally absent in slips.) Incidentally, a piece of pottery may be entirely slipped on all surfaces (interior, exterior, bottom, appendages, etc.) or only partially so (reserved pattern, zoning, etc.). Speaking strictly from the technical standpoint, painting over a plain (non-slipped) surface with a medium composed of clayey substance, is tantamount to slipping. On the other hand, crustation cannot be equalled to slipping under any circumstances for, by virtue of its definition, it implies application *after* the firing.

It often happens that a potter, in the final stages of surfacing produced by hand smoothing, imposes somewhat of an additional coat of paste. However, the paste is then of the same constituent qualities and general properties as that used in the construction of the pottery piece. In the fabric, such a coating is not distinguishable unless incomplete bonding, air bubbles, or other defects attributable to mechanical agencies, delineate it from the body proper. To call an instance of this kind "slipping" would certainly be erroneous. Similarly, should a potter intentionally cover an entire surface with a coat of the same paste as she used in the construction, the result would not be a slip. Accordingly, the designations "self-slipping" and "mechanical slip" would not seem tenable, for a pot cannot slip itself, nor can mechanical means (polishing) produce a slip. All this reasoning inheres in the unavoidable necessity of demonstrating qualitative differences between the receiving piece and the applied medium which alone can stand absolute tests of objective methodology.

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KAWAIKA-A IN THE HISTORIC PERIOD

The westernmost of the great Pueblo IV sites of the Jeddito Valley is Awatovi, occupied through the exploration and mission periods to 1700. The next upstream is Kawaika-a, inhabited, on the basis of archaeological evidence, at least to the end of the fifteenth century: a tree-ring date of A.D. 1495.[1] Historical evidence has been thought to indicate sixteenth-century occupation of Kawaika-a, and destruction by Tovar in 1540.[2] It has even been taken to show that Kawaika-a was sparsely repopulated by 1583, and finally deserted only between that date and 1598.[3] That abandonment in 1540 was final, if Kawaika-a actually was destroyed by Tovar in July of that year, is more generally believed, however,[4] as the statement by Luxán that "a few of the bravest, observing their arrival, came to meet them"[5] obviously refers, as does the next sentence, to people from Awatovi: they were already at Kawaika-a, which was deserted and ruined, and is not given a name, and their arrival there was noted at Awatovi one league (in this case, six miles) off. The five Hopi pueblos are named and discussed by Luxán; it is clear that Kawaika-a was uninhabited.

[1] Douglass, A. E., "Southwestern Dated Ruins: V," *Tree-Ring Bulletin*, Vol. 5, No. 2, 1938, p. 11.

[2] de Luxán, Diego P., translated and edited by George P. Hammond and A. Rey, *Expedition into New Mexico made by Antonio de Espejo*, Quivira Society, Vol. 1, 1929, p. 96, fn. 107.

[3] Hargrave, L. L., "The Jeddito Valley and the first Pueblo towns in Arizona visited by Europeans," *Museum Notes*, Vol. 8, No. 4, 1935, p. 21.

[4] Hodge, F. W., *History of Hawikuh*, Los Angeles, 1937, p. 118, fn. 143; Katharine Bartlett, "Spanish contacts with the Hopi," *Museum Notes*, Vol. 6, No. 12, 1934, pp. 55–56.

[5] Luxán, *op. cit.*, p. 96.

The story given by Luxán does not fit at all with statements in the Coronado documents. Luxán says that they halted at a pueblo "that had been attacked and destroyed by Coronado because they had killed five of the nine men he had sent to discover this province of Mojose while he remained in the province of Sumi. When Coronado heard the news he fell upon it with his men and devastated and destroyed it."[6] Obregón says that the four old Hopi men (the ones, not mentioned by Luxán, who came to Cíbola from Moqui and told the Spaniards not to come to their pueblos) stated that Don Pedro de Tovar had destroyed a city of Tusayan to avenge the death of five Christians killed by the natives.[7] This is a less strange story than Luxán's; yet Obregón does not mention their stopping at or seeing this pueblo.

There is no suggestion of any such occurrence in the Coronado documents. Tovar and Fray Juan de Padilla took twenty soldiers to Tusayan; they had a brush with the Hopi but won promptly and the Hopi were obedient and friendly thenceforth.[8] The Relación del Suceso[9] and Jaramillo[10] do not mention even this fight. The story does not seem to be the battle of Hawikuh or the siege of Tiguex misplaced. Possibly this story was a misinterpretation and confusion, comparable to that on pp. 91–92 of Luxán.

Suppression of the incident in the Coronado documents for political reasons, as a pro-Kawaika-a, so to speak, faction might argue, is extremely unlikely: the burning of all the Tiguex pueblos, largely because of which Coronado and Cardenas were tried and sentenced, is given fully.

It has been supposed, on the basis of the statements in the Coronado documents (Castañeda, Jaramillo, Coronado himself, and the *Relación del Suceso*), that there were seven Hopi towns, and that both Kawaika-a and Sikyatki were still occupied in 1540.[11] This is perfectly possible, but the evidence is very far from sufficient. Castañeda and Coronado also say there were seven Zuñi towns, as does the *Relación Postrera;* Jaramillo apparently says there were five; and actually there probably were six.[12]

The most that can definitely be said for Kawaika-a in the historic period is that it is one of the very few prehistoric ruins identifiable as specifically mentioned—as a ruin—in the early documents. That Kawaika-a was occupied past the year 1500 is very probable; that it was occupied considerably, perhaps forty or fifty years, past that year is perfectly possible. That Kawaika-a was inhabited in 1540 is, however, undemonstrated; that it was destroyed in that year by Tovar seems unlikely.

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FURTHER NOTES ON THE SUSANVILLE ATLATL

Shortly after the original article on the Susanville atlatl appeared in AMERICAN ANTIQUITY,[1] Mr. M. R. Harrington, Curator of the Southwest Museum, wrote us that he had information which would probably clear up the problems presented by this unusual specimen. In the first place, it appears that Charlie Paiute was not the principal in the

[6] *Ibid.* [7] Hammond and Rey, *Obregón's History*, Los Angeles, 1928, pp. 327–328.

[8] Castañeda, Pt. 1, Ch. 11; Hammond and Rey, *Narratives of the Coronado Expedition*, Albuquerque, 1940, p. 214.

[9] Hammond and Rey, *op. cit.*, p. 286. [10] *Ibid.*, p. 299. [11] Bartlett, *op. cit.*

[12] Hodge, *op. cit.*, pp. 1–3, 28, 56–57. Hodge (p. 56) translates Jaramillo as saying "five little villages besides this." Hammond and Rey (*op. cit.*, p. 298) give "five small pueblos including this one." There is no apparent evidence that Pinnawa or any other possible seventh city of Cíbola was still occupied in 1540 (Hodge, *op. cit.*, p. 57, and Leslie Spier, *An Outline for the Chronology of Zuni Ruins*, American Museum of Natural History, Anthropological Papers, Vol. 8, No. 3, 1917, p. 271), though the forthcoming restudy of Dr. Spier's material by Dale S. King may conceivably produce such evidence.

[1] Vol. 7, No. 2, Pt. 1, 1941.

case, but rather his son-in-law, George Evans, husband of Charlie's daughter, Orrie Evans. Secondly, the evidence is incontrovertible that the origin of the Susanville atlatl was due to stimulation, by a professional archaeologist, of a native Indian workman. This possibility was recognized by us[2] where we stated " . . . Charlie Paiute may have learned the use of the atlatl in recent times from someone who was familiar with the San Juan archaeological specimens." Had we said here "San Juan archaeological *type*," we should have been quite correct, since the pattern for the Susanville specimen was either the San Juan type, or similar specimens from Council Hall cave in east central Nevada which was excavated by M. R. Harrington, with the aid of George Evans, in 1925 or 1926.

We quote, with Mr. Harrington's permission, his letter to Heizer of October 21, 1941.

"I was interested to see in the October issue of AMERICAN ANTIQUITY an article by yourself and Fenenga on the origin and authenticity of an atlatl and atlatl dart from Lassen County, California. I think I can give you additional information on this matter.

"In 1924, when Mr. L. L. Loud and I were excavating Lovelock Cave, we employed a mixed blood Pit River Indian by the name of George Evans, who became very much interested in the work and incidentally very skilful. He took especial note of the fragmentary atlatls we obtained at the time and a year or two later, when we found others in Council Hall Cave, Smith Creek Canyon, Nevada, he thought he would like to manufacture some and practice with them. This he did and was still interested in the subject when he was employed in the excavation of Gypsum Cave in 1930. In fact, I have a photograph of George making an atlatl dart in our Gypsum Cave camp, and still have several examples made by him.

"His home was at Susanville in Lassen County, where he died a few months ago, and he is probably responsible for the making of atlatls by other Indians in that same settlement.

"In 1927, while visiting the Pyramid Lake Paiute reservation, I was talking with Dr. McKinley, who was superintendent at that time, and happened to mention the use of atlatls before the bow and arrow was introduced into that district. Dr. McKinley astonished me by stating that the atlatl was known and used by the present day Indians at Pyramid Lake and in support of his statement he produced a photograph which turned out to be a picture of George Evans and the atlatl and dart I had seen him make. The atlatl was copied from specimens we had found at Council Hall Cave, which are now, or should be, in the State Building at Reno or in the Nevada Historical Society's possession.

"Incidentally George told me that he had never heard of this type of weapon before he saw the specimens at Lovelock Cave. As I say, he was a Pit River Indian married to a Shoshone but he had been previously married to a Maidu [Orrie Evans] and could speak Pit River, Paiute and Shoshone fluently and could get along very well with the Maidu language."

Mr. Harrington has also sent us sketches of several atlatls and a dart made by George Evans and now in the Southwest Museum at Los Angeles. One is a typical San Juan specimen complete with hide finger-loops and stone weight; the other is the type found by Harrington in the Ozarks with a dowel-peg handle. The dart (unlike the Susanville specimen) is cup-ended for engagement with the atlatl spur, has three radial feathers, a hardwood foreshaft and chipped stone point.

To fit this explanation of the origin of the Susanville atlatl, it need be pointed out that our white informant, Mrs. McDow, was unreliable as far as dates and characters were concerned. The atlatl, it is true, may have been left with her husband by Charlie Paiute, but its introduction to the Susanville area is undoubtedly ascribable to George Evans, whose home and wife were located there.

[2] *Ibid.*, pp. 139, 140.

The fact that we have been able to solve this problem does not detract from its interest. It serves to emphasize the point that we should all be alive to the possibilities of introduction of "foreign" aboriginal forms in historic times.

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W. B. NICKERSON—PIONEER IN SCIENTIFIC ARCHAEOLOGY

In recent years there has been a lamentable tendency on the part of academic archaeologists to professionalize their field, with a consequently growing distinction between "amateurs" and "professionals." That this distinction is a false one has been demonstrated by the work of such "amateurs" as Lemley of Arkansas, Langford of Illinois, and many others. The boundary between these two classes of excavators has been one of attachment or non-attachment to an academic institution, without regard to the real issue: techniques. This distinction is happily undergoing process of change, as the very existence of AMERICAN ANTIQUITY bears witness. Founded as an outlet for both amateur and professional work, it has done much to allay hostilities and opposition on both sides.

If we consider the distinction between these two types of excavators in terms of the techniques used in excavation and analysis, we arrive at a graded series, with some amateurs and some professionals occupying both the excellent and poor categories. If we go back in history, we find that most of the great "professionals" were also amateurs—can we consider Holmes an amateur merely because archaeology was a field foreign to his original training?

One of these great "amateurs" of the past, whose work is virtually unknown, was W. B. Nickerson of Illinois, who surveyed and dug in Jo Daviess County and the nearby area between 1895 and 1901, and reported on small finds in other states from 1884. A man of little formal education, he operated a railroad signal tower by day, and dug by night and in the few spare hours he could find. Nickerson enlisted the support of Harvard's Peabody Museum in the later years of his work, and his specimens and a final draft of his work were deposited in the Museum. His three published articles appeared in *Records of the Past*, Vol. 7, 1908, and Vol. 10, 1912.

When the University of Chicago began its survey of the state of Illinois in 1926, student Paul Martin (now curator of anthropology at the Field Museum) was sent to Jo Daviess County in the initial phase of the work. Martin heard of Nickerson's activities and soon contacted his widow in Kidder, Iowa. Nickerson himself had died only a few weeks earlier. Martin went over Nickerson's notes and drawings, and was led to remark in his daily journal,

"A cursory examination of his notes, plans, and final report were enough to convince us that he was a *most* careful worker—almost too careful—and very scientific. His method of digging was modern . . . he worked between trains—as he was an operator of a signal tower for the I.C.R.R.—running up to the bluffs and often working late at night with the aid of a lantern, or digging in winter when the ground was often frozen."

Nickerson's final manuscript was submitted to the Peabody Museum in 1913, but as a result of the pressure of war years, was never published. The University of Chicago, with the kind permission of the Peabody Museum, has since acquired this report and Nickerson's field collections and is preparing it for publication in the near future in connection with some of its own work in the same area.

Nickerson not only displayed extreme technical sophistication, but had a breadth of viewpoint conspicuously lacking in his day. Archaeology was not a goal in itself, but merely a key for unlocking the whole historical perspective of the American Indian and aboriginal man. In the Introduction to his report, he says,

"The aim and end of the study of prehistoric archaeology is, it seems to the writer, the re-creation of authentic, virile, human history—not merely the collection of museum exhibits. The one is the re-embodiment of primitive man and the telling of his story; the other is but the mechanical aids to his physical needs—a dead record which without life can tell but half the story."

To attain this end, Nickerson not only used the exact methods of modern excavation, but the supplementary techniques of topographic surveying, field geology, and ethnological reports. From his Introduction again,

"The district, therefore, to be properly studied should be looked at not only from the standpoint of the archaeologist but also with the eye of the topographist and geologist, and never losing sight of the light which contemporary ethnographical research in America has thrown upon all archaeological research."

Nickerson included appendices of local accounts of historic Indian burials, reports of the alluvial geology of the area, and weighed the extravagant claims of earlier excavators with a balance and precision that seems incredible to younger students who entertain the notion that all diggings prior to the Indianapolis Conference must be considered little more than garbage pits.

To mention only a few of his technical achievements: (1) He used a datum plane for recording all artifacts and locating features on his profile drawings. He called it a "zero base line"; (2) He used a five-foot grid system, staking out his mounds and excavating his "blocks" by levels measured from the datum plane. Two main axes divided the dig into "sections," each of which had its own numbered "blocks"; (3) He recorded all his finds on coordinated ground plans and five-foot profile drawings, with detailed symbol keys. His profiles and ground plans appear in alignment on single large sheets, so that they can be read with a minimum of reference to the text; (4) He used a mattock exclusively for vertical excavation, carefully smoothing his profiles, and planing his floors with a sharpened shovel; and (5) He relocated all his excavations with stakes marking the trench limits, and burying these stakes when he restored the mound.

Nickerson's impeccable scientific taste prohibited any gross conclusions as to the antiquity and origin of the aborigines of his region. He refers to the "*Indians* who built these mounds"—not to the later unfortunate term, "Mound Builders." He accurately foresaw the tremendous importance pottery was to have in analyzing culture differences, and pointed out typological difference in general as a lead in discovering historical divergencies. In his Conclusions he states,

"An unfortunate tendency of recent years to group all of the tumuli of a district under one period, without adequate evidence to prove this statement . . . is to be deplored in that it has insidiously alienated the interest and sympathy of the public . . . and thereby the financial assistance necessary for its development . . . superficial and ill-considered evidence of this type has some times been given an undeserved pre-eminence to foster a bias. . . ."

To demonstrate the pitfalls of undue interpretation, Nickerson outlines in detail the embarrassing parallelisms of the English long barrows with some of the Jo Daviess mounds, then comments on the dangers of such broad comparisons for the naive mind interested in proving some outlandish theory.

Another feature of Nickerson's theoretical approach which sounds incredibly modern is his emphasis on the importance of village remains. Foreshadowing Deuel's later concept of the "community," Nickerson insisted that burial traits alone will not give a true picture of a particular culture,[1] and included a plea for more scientific excavation of refuse deposits. This, in a period when little else but a Hopewell mound or a Maya ruin was considered worthy of the pick and shovel!

[1] Incidentally, that elusive and controversial word, "culture," does not appear even once in Nickerson's manuscript!

With few qualifications, we can say that Nickerson's techniques and interpretive balance were as mature and sophisticated as those of the finest dirt archaeology of today. We also feel that in general, his systems of notebook recording in the field (tremendously detailed and pictorial), profile and ground plan drawing, and grid-and-level coordination were considerably in advance of anything of his period.

In exploring the reasons why all this good work remained in obscurity we must remember that Nickerson was in constant communication with the great F. W. Putnam of Peabody, and if the blame must be shoved on anybody's shoulders, the broad clavicles of Professor Putnam seem the handiest. However, during this period Putnam was tremendously busy directing other projects, and consolidating the Harvard department, and so may have been prevented from adequately appraising Nickerson's work. Moreover, Nickerson was working in decidedly unspectacular mounds, which for the period were pretty dull archaeology. Finally, technique as careful and precise as Nickerson's simply went unnoticed, it was not part of the archaeological outlook of the day. A man was judged not by how he dug, but what he dug, and above all, what he brought back.

Putnam did at least partially recognize the value of Nickerson's contribution, however, because in a letter to Nickerson dated May 25, 1896, he stated,

" . . . At all events I shall show your manuscript as a piece of good and careful work, and I hope it will incite my students to do similar work."

As to how Nickerson "got that way," there are few satisfactory answers. He had read extensively in physical anthropology, archaeology, ethnology, geology, and general literature. His manuscript is replete with accurate references to the human skeleton, extant archaeological treatises, and the geological writings of such pioneers as Salisbury and Chamberlin. His knowledge on these subjects was not that of the tyro anxious to display his factitiousness, but rather that of the unemotional scientist using all available disciplines to clarify his descriptions.

Nickerson furthermore had considerable practical knowledge of topographic surveying, and the influence of this methodology in his excavating is plain. Doubtless Putnam had some influence in shaping his work, but a study of the correspondence between the two men displays nothing more than a role of "encourager" for Putnam.

Nickerson belongs to that great body of so-called amateurs, who though not academically trained, see science as a way of thinking and behaving, that can be mastered by an intelligent appraisal of existing work and the use of one's own judgment, and not by the magic of the postscript "Ph.D." As far as archaeology is concerned, it means nothing whether we call him an amateur or a professional. It is sufficient to show he was an excellent archaeologist.[2]

In an article entitled "The Mound Builders: A Plea for the Conservation of the Antiquities of the Central and Southern States," Nickerson criticized the excavation methods of the Bureau of American Ethnology of the period, stating that,

"The structure must be laid open and examined by vertical sections over the entire area covered by the mound, and if it is desired to retain it as a prehistoric monument it may be rebuilt. Anything short of this gives partial results which cannot become a basis for accurate deductions."[3]

JOHN BENNETT
University of Chicago

[2] The archaeological importance of Nickerson's work has only become evident with the recent interest in Woodland and Hopewellian. He excavated mounds showing an approximate gradation of traits all the way from the simple conical-linear-effigy types of Wisconsin, up to the elaborate large conicals with log tombs and artifacts highly suggestive of Hopewellian. A detailed analysis of this situation will appear in the University of Chicago's forthcoming publication.

[3] *Records of the Past*, Vol. X, pp. 335–339.

BOOK REVIEWS

Aztecs of Mexico. Origin, Rise and Fall of the Aztec Nation. GEORGE C. VAILLANT. (pp. 340. $4.00. New York: Doubleday, Doran and Co., Inc., 1941.)

The notable success achieved in this book is in the fact that it rests securely on two stools between which it is more usual to fall. It is a scholarly synthesis; it is also easy and informative reading for the general public. The student of ancient Mexican civilization has in this volume, written frankly for popular reading, an unexcelled summary of research in his field. The book shows that to popularize learning is not necessarily to corrupt it.

It does not detract from recognition of this success to admit that Dr. Vaillant's work does not, as no compromise can, satisfy every demand imposed by two different objectives: to report scholarship, and to interest the layman. It would have been possible to write a book that more people would have found easy to read. It would have been possible to write a work of more critical scholarship. It is because this book combines interest and accuracy in unusual degrees of both that it is to be heartily applauded.

Obedient to the historical nature of his specialized learning, Dr. Vaillant gives first to the reader his four chapters which (he is frank to admit) are the hardest to read. Just where the author is technically most competent—in exposition based on archaeological materials—his pages are most difficult for the ordinary reader. In spite of able effort, the archaeological contributions to the book, with their terminology of culture types and periods, remain not quite assimilated into the layman's language.

On the other hand, there will be specialists who will find something to criticize from their point of view. The account of Toltec culture suggests a sureness of knowledge of that subject which exacting scholarship would probably hesitate entirely to sponsor. Aztec social organization is presented in a way that this reviewer thinks takes Bandelier too much for granted. In the pages describing political, economic and familial aspects of ancient Mexican life, not a few objections and caveats might well be entered. If blame should attach to anyone for the inclusion of statements of dubious validity, it should probably attach, not to Dr. Vaillant, but to the historical anthropologists for their failure, in the years since Bandelier, properly to evaluate and go beyond his work.

Such criticism of the present book, just though it is, cannot change the fact that it is an excellent work, rich in fact, illuminated by analogy or comparison, and guided by authoritative knowledge. Among features which might be picked out for special commendation are: the setting of the immediate topic against a background of hypotheses as to the beginning of Indian civilization as these hypotheses currently stand with important recent revisions as to agriculture; the incorporation of tabular summaries of archaeological or historical series; the degree of success attained in communicating to a lay reader the nature of the ultimate sources of both document and artifact; the effective use of cuts derived from codices to illustrate features of Aztec life; the vivid re-creation of the actuality of Aztec living in Chapter XIII (which does what Leslie Mitchell did for the ancient Maya, only better).

The book has index, bibliography, and a moderate array of well-chosen footnote references. The last chapter provides suggestions for an archaeological tour in Mexico and strengthens the claim of the book on the layman's interest. The reader will also be glad for the explanations of the pronunciations of names of Indian derivation which are approximately given (although with some odd inconsistencies). The map on the end papers is exceptionally good.

ROBERT REDFIELD
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Los mayas antiguos. Edited by CESAR LIZARDI RAMOS. (pp. 361, 99 figs., 2 colored pl. $[Dollars] 5.00. El Colegio de Mexico, Panuco 63, Mexico, D. F., 1941.)

In 1841–42, following their first explorations in Central America, John Lloyd Stephens and Frederick Catherwood spent seven months in Yucatan, discovering and recording numerous Maya ruins. As author of the resultant books, Stephens has frequently been regarded as the father of Maya archaeology, yet his text would have had considerably less value were it not for the illustrations, the work of Catherwood. It is, therefore, pleasant to find that this book commemorating the centenary of this trip to Yucatan is dedicated by the editor equally to both travellers.

On Mr. Lizardi Ramos, as editor, fell the task of seeking not only articles by specialists in the Maya field, but also a publisher, since the governmental aid promised him failed to materialize owing to political changes. Undeterred, he continued his efforts with noteworthy success with the result that, unlike too many publications from south of the Rio Grande, this volume is well printed on good paper and with excellently reproduced illustrations, including two in color. Of the eighteen articles covering all fields of Maya research about one half are in English, the rest in Spanish. Since it is impossible to review each article separately only the scope of the book can be indicated.

In the field of archaeology, Vaillant's "Matrix of Maya History" is written with the author's customary brilliance. Lawrence Roys discusses masonry traits at Mayapan, and Satterthwaite brings together much important material on Peten architectural influences at Piedras Negras. Fernandez records valuable new fragments of frescoes from Tulum. Of prime importance is Wauchope's paper, "Effigy head vessel supports from Zacualpa," because its clear dating of this widespread trait will be of very considerable assistance in correlating geographically separated horizons. Sculptures of an unusual type from Campeche and two peculiarly decorated skulls from Guatemala are discussed by Andrews and Juarez Muñoz respectively. Beyer and Lizardi Ramos treat authoritatively of aspects of the Maya lunar calendar.

In the field of ethnology, Villa and Thompson contribute articles on the Mayas of Quintana Roo and British Honduras, and Baqueiro Foster discusses Maya music. In linguistics, Barrera Vasquez writes on certain words in Yucatec, and Palacios offers an ingenious solution of names for the Huaxtec country. Tozzer sheds light on the intellectual relationships between Stephens and Prescott and other contemporaries in the field of New World history, and Gropp contributes a full bibliography of Stephens and Catherwood. Concluding the book is an excellent summary by Palacios of the story of Maya research in the century that has elapsed since the explorations of Stephens and Catherwood. The editor is to be congratulated on the production of this important publication.

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The Last Million Years. A. P. COLEMAN, edited by George F. Kay. (University of Toronto Press, 1941.)

The major portion of this work was written several years before the death of Dr. Coleman in 1939. As a semipopular and interestingly written book upon some of the better known phenomena of glaciation, it is not without value. A foreword, however, carries the following comment: "Some sections required revision . . . and Dr. Kay has brought these up to date." In view of the fact that the index does not even carry the term "Folsom," that none of the wide literature on Pleistocene man by Roberts, Howard,

and a dozen others is mentioned, the above quoted remark seems an overstatement, to say the least. As an up-to-date study, the long wait of this book for publication has made it obsolete.

LOREN C. EISELEY
University of Kansas

Lost Worlds, Adventures in Archaeology. ANNE TERRY WHITE. (pp. 316, 51 ill. $2.50. Random House, New York, 1941.)

The true test of a juvenile is to give it to a child to read. I did this with *Lost Worlds*, using my ten year old son as the guinea-pig. He not only said that he liked it very much, but read it almost at one sitting, and wanted to talk about it afterward. This experiment was therefore a success, and so, let us hope, will be the book, particularly since experience with older guinea-pigs indicates that it can also be read profitably by adults.

The subject of *Lost Worlds* is the story of how different men have dug critical sites, and have explored the basic problems of archaeology; in other words, how individual personalities have been responsible for the progress made in archaeology during the last century. Mrs. (Miss?) White tells first about Schliemann, how he came to be interested in Homer and in Troy, and how he went to the Dardanelles and dug the hill of Hissarlik, and of the other events of his life. She then recounts the adventures of Sir Arthur Evans in Cretan archaeology, and proceeds to give a history of the basic research in Egypt and Mesopotamia, in terms of the men who have dug in those valleys. Finally, she devotes the last fourth of the book to Mayan archaeology, in particular to the work of Stephens, E. H. Thompson, and the staff of the Carnegie Institution.

Mrs. (Miss?) White is obviously not an expert in all these fields, but she has been very wise in seeking authoritative counsel. For this reason her statements of archaeological problems are conservative, sound, and pertinent, and one finds in her book no endorsement of crackpot theories which vitiate many other popular works on science, and particularly on prehistory. Above all, she writes clearly and organizes her material well. *Lost Worlds* should help to arouse in a wide audience, young enough so that it will do some good, that sound interest in historical problems so needed in developing objective attitudes in a civilized society.

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McCain Site, Dubois County, Indiana. REX K. MILLER. (Prehistory Research Series, Indiana Historical Society, Vol. 2, No. 1, 60 pp., 17 pl., 3 drawings. Indianapolis, 1941.)

This report presents the preliminary results of an investigation of a shell midden site located along the White River in south-central Indiana. The archaeological materials thus far accumulated, along with negative indications of pottery and agriculture, assign the complex to the widespread archaic horizon of the East. In addition to the more generalized traits usually associated with this early culture, certain specialized elements common to archaic stations of Kentucky, Alabama, and Georgia, and of New York are also present here. The partial agreement between the known manifestations of this complex in New York, and in Kentucky has already received comment by specialists in the area. Inasmuch as the McCain site occupies a geographic position approximately intermediate to these two regions, the results of further investigation will be awaited with

interest. This publication reflects an awareness of current archaeological procedures in the recovery and treatment of materials and data. The author, a non-professional, is therefore to be commended for his labors.

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Art Processes in Birchbark of the River Desert Algonquin, a Circumboreal Trait. FRANK G SPECK. (Bulletin 128, No. 17, pp. 229–274. Bureau of American Ethnology. Washington, 1941.)

Several years ago Dr. Speck published a valuable report on Montagnais art in birchbark.[1] The present study is a carefully prepared and useful companion work to his earlier paper. Together they go far to fill the need for sound descriptive and comparative studies of the art forms of the Northeast.

The report on the birchbark art of the River Desert Algonquin is based on museum specimens collected primarily by Speck, partly by Sapir, Johnson, and Petrullo, and augmented by information obtained by Speck in the field. In his examination of birchbark products, Speck first gives an account of the varieties of bark containers according to the method of construction. In this section, he wisely includes data concerning the uses of the various types. Next, he considers the types of designs, first as to the techniques of their production, and second as to the character of the design elements used. Of the latter, he feels that one category is plainly of European origin—the ribbon bow, for example—but that there is another category which is also common to neighboring tribes and which probably belongs to an older tradition. This consideration of design elements opens up the problem of the origin of the non-geometric art of the Northeast. In concluding sections on the conscious factors of design motivation and on the chronology of Algonquin designs, Speck questions again the view that the curvilinear art of the Northeast is of European origin. Noting a conscious attempt at portrait realism of animals and plants in the birchbark work of Algonquin Indians, Speck points out that the utilization of these features of the natural environment may well be aboriginal in this region where the relation between man and nature is so close and intimate. It is certainly true that contact with Europeans has affected Northeastern art, but Speck makes a valuable point by indicating the distinct probability of an earlier aboriginal tradition of plant and animal designs and the lack of evidence that this type of art necessarily stems from European contact. Unfortunately, the perishable nature of birchbark work and the absence of prehistoric specimens seem to preclude a final answer to the question.

Although the art forms of the Northeast have occasioned no little discussion, particularly as to their origin and development, there has been a lack of careful studies of the tribal art of different groups. The present report is a distinct contribution on this fundamental level. However, Speck's paper goes further, for it not only contains speculations as to the history of the art forms under consideration, but also includes numerous comparisons of the birchbark work of the River Desert Algonquin and that of neighboring peoples. It is the reviewer's hope that Speck will push these comparisons still further and provide us with a rigorous comparative survey of the birchbark work of the general Northeastern area. This is not to decry the value of the present study, which takes its place beside Speck's numerous other stimulating contributions to Woodland ethnology.

ALEXANDER SPOEHR
Field Museum of Natural History

[1] Speck, F. G., *Montagnais Art in Birchbark, a Circumpolar Trait* (Indian Notes and Monographs, Museum of the American Indian, Vol. 11, No. 2, pp. 45–157, 1937).

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